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NATIONAL DAM SAFETY PROGRAM. AMPHIBIOUS LAKE DAM (NJ 00457), DE--ETC(U)
JUN 79 J J WILLIAMS DACW61-79-C-0011

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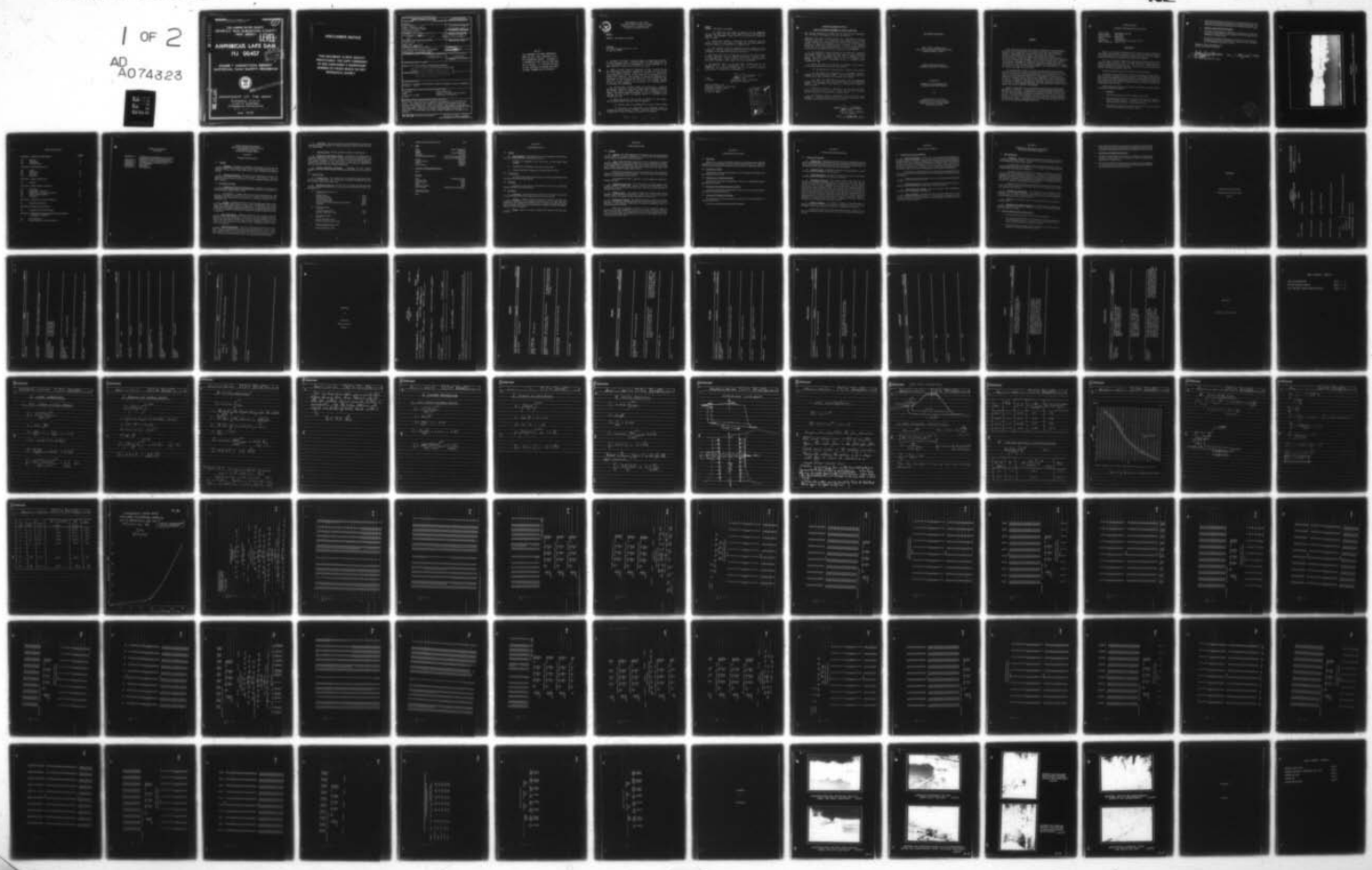

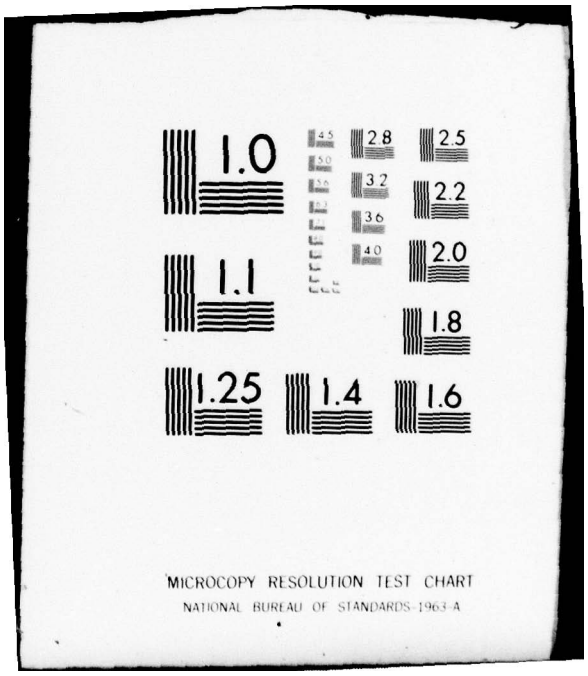
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DELAWARE RIVER BASIN
NEWBOLD RUN, BURLINTON COUNTY
NEW JERSEY

LEVEL II

AMPHIBIOUS LAKE DAM
NJ 00457

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

DEPARTMENT OF THE ARMY

Philadelphia District
Corps of Engineers
Philadelphia, Pennsylvania

June, 1979

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

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3. RECIPIENT'S CATALOG NUMBER

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National Dam Safety Program
Amphibious Lake Dam
Burlington County, N.J.

5. TYPE OF REPORT & PERIOD COVERED: (9) FINAL report

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7. AUTHOR(s): Williams, John J. / Williams (10)

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9. PERFORMING ORGANIZATION NAME AND ADDRESS:
O'Brien & Gere Engineers Inc.
Suite 1760
1617 J.F. Kennedy Blvd.
Phila. Pa. 19103

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

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Custom House, 2d & Chestnut Streets
Philadelphia, Pennsylvania 19106

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(6) National Dam Safety Program. Amphibious Lake Dam (NJ 00457), Delaware River Basin, Newbold Run, Burlington County, New Jersey. Phase 1 Inspection Report.

17. DISTRIBUTION STATE

18. SUPPLEMENTARY NOTES

Copies are obtainable from National Technical Information Service, Springfield, Virginia, 22151.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Embankment
Dams
Structural Analyáis
Safety
Visual inspection
National Dam Inspection Act Report
Amphibious Lake Dam, N.J.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE—2 D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO
NAPEN-D

SUBJECT: Dam Inspection Program

Commander
U.S. Army Training Center at Ft. Dix
Ft. Dix, NJ 08640

1. Inclosed is the Phase I Inspection Report for Amphibious Lake Dam, Ft. Dix, Burlington County, New Jersey which has been prepared for the U.S. Army Engineer District, Philadelphia. A brief assessment of the dam's condition is given in the front of the report.

2. Based on visual inspection, available records, calculations and past operational performance, Amphibious Lake Dam, initially listed as a high hazard potential structure but reduced to a significant hazard potential as a result of this inspection is considered to be in overall fair condition. The spillway is considered inadequate since 20 percent of the Spillway Design Flood -SDF- would overtop the dam. (The SDF, in this instance is one half of the Probable Maximum Flood.) To insure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillway's adequacy should be determined by a qualified professional consultant using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Any remedial measures necessary to insure the adequacy of the spillway and to prevent overtopping should be initiated within calendar year 1980.

b. Within six months from the date of approval of this report, the following remedial actions should be completed.

(1) The dam should be provided with a reservoir drain system.

(2) The marshy area downstream of the embankment should be regraded to provide adequate drainage. Discharge from the area should be monitored to detect turbidity or increases in discharge.

(3) Trees and brush should be removed from the embankment and the area where trees have been removed should be backfilled and regraded. The embankment slopes should be protected with vegetative cover or riprap.

c. Develop and implement a maintenance and inspection checklist similar to the one in this report, to insure that all items associated with the structure are maintained on a regular basis.

d. The structure should be monitored during periods of heavy discharge. A warning system should be developed and implemented when necessary for the downstream area used for bivouac.

3. Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia, 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

4. An important aspect of the Dam Safety Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken to implement our recommendations.

Incl
As stated

JAMES G. TON
Colonel, Corps of Engineers
for District Engineer

Copies Furnished (trip)
Directorate of Engineering & Housing
Buildings & Grounds Division
U.S.A.T.C. at Ft. Dix
Ft. Dix, NJ 08640

AMPHIBIOUS LAKE DAM (NJ00457)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 12 April 1979 by O'Brien & Gere Engineers, Inc. for the U.S. Army Engineer District, Philadelphia.

Amphibious Lake Dam, initially listed as a high hazard potential structure, but reduced to a significant hazard potential as a result of this inspection is considered to be in overall fair condition. The spillway is considered inadequate since 20 percent of the Spillway Design Flood -SDF- would overtop the dam. (The SDF, in this instance is one half of the Probable Maximum Flood.) To insure adequacy of the structure, the following actions, as a minimum, are recommended:

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b. Within six months from the date of approval of this report, the following remedial actions should be completed.

(1) The dam should be provided with a reservoir drain system.

(2) The marshy area downstream of the embankment should be regraded to provide adequate drainage. Discharge from the area should be monitored to detect turbidity or increases in discharge.

(3) Trees and brush should be removed from the embankment and the area where trees have been removed should be backfilled and regraded. The embankment slopes should be protected with vegetative cover or riprap.

c. Develop and implement a maintenance and inspection checklist similar to the one in this report, to insure that all items associated with the structure are maintained on a regular basis.

d. The structure should be monitored during periods of heavy discharge. A warning system should be developed and implemented when necessary for the downstream area used for bivouac.

APPROVED: Jack K. Clarkson

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

DATE: 13 September 1979

DELAWARE RIVER BASIN

Name of Dam: Amphibious Dam
County & State: Burlington County, New Jersey
Inventory Number: NJ 00457

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Prepared by:

O'BRIEN & GERE ENGINEERS, INC
JUSTIN & COURTNEY DIVISION

For

DEPARTMENT OF THE ARMY
Philadelphia District, Corps of Engineers
Custom House-2nd & Chestnut Streets
Philadelphia, PA 19106

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I REPORT

NATIONAL DAM INVENTORY PROGRAM

Name of Dam:	Amphibious Lake Dam
State Located:	New Jersey
County Located:	Burlington
Stream:	Newboid Run
Coordinates:	Latitude 39° 59.9', Longitude 74° 36.1'
Date of Inspection:	April 12, 1979

ASSESSMENT

Based on the visual observations made during the field investigation, information made available by the Directorate of Facilities Engineering, Fort Dix and conversations with the Owner's representative, Mr. Harry E. Colbert, Amphibious Lake Dam is considered to be in overall fair condition.

The dam is an earth embankment approximately 300 feet long with a maximum height of about 13 feet. A 35-foot wide paved road (Route 545) is constructed along the crest of the dam. The spillway is a wooden drop inlet structure located near the right abutment of the dam. The 9 acre normal pool is used for recreation by personnel of Fort Dix.

The dam is considered to be in the "Significant" hazard category.

Examination of the results of the hydrologic and hydraulic analyses indicate that the spillway is capable of passing 19 percent of the Spillway Design Flood (SDF) without overtopping the earth embankment. The SDF chosen for use on this site is 50 percent of the Probable Maximum Flood (PMF). The Spillway is classified as "Inadequate" but not "Seriously Inadequate" because the dam is a "Small" size, "Significant" hazard structure.

Several deficiencies noted, require further investigation, remedial measures or maintenance as soon as possible:

a. Facilities.

1. The dam should be provided with a reservoir drain system.

2. The marshy area downstream of the embankment should be regraded to provide adequate drainage. Discharge from the area should be monitored to detect turbidity or increases in discharge.

3. The capacity of the spillway should be increased in accordance with the results of the hydrologic and hydraulic studies.

4. Trees and brush should be removed from the embankment and the areas where trees have been removed should be backfilled and regraded. The embankment slopes should be protected with vegetative cover or riprap.

b. Operation and Maintenance Procedures.

1. The Owner should develop and implement a maintenance and inspection checklist to insure that all items associated with the structure are maintained on a regular basis.

2. The structure should be monitored during periods of heavy discharges. A warning system should be developed and implemented when necessary for the downstream area used for bivouac.

O'BRIEN & GERE ENGINEERS, INC.
JUSTIN & COURTNEY DIVISION

John J. Williams

Date: 1 August 1979

John J. Williams, P.E.
Vice President
New Jersey Registration No. 24916

OVERVIEW
AMPHIBIOUS LAKE DAM, BURLINGTON COUNTY, NEW JERSEY
4/11/79

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TABLE OF CONTENTS
(Continued)

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM
AMPHIBIOUS LAKE DAM
INVENTORY NUMBER NJ00457

SECTION 1

PROJECT INFORMATION

1.1 General

a. Authority. This report is authorized and prepared in accordance with contract #DACW 61-78-C-0052 between O'Brien & Gere Engineers, Inc., Justin & Courtney Division and the United States Army Corps of Engineers, Philadelphia District.

b. Purpose of Inspection. The purpose of this inspection is to evaluate the structural and hydraulic condition of the Country Lakes Number 1 Dam and appurtenant structures and to determine if the dam constitutes a hazard to human life or property.

1.2 Description of Project

a. Description of Dam and Appurtenances. Amphibious Lake Dam is an earth embankment approximately 13 feet high and 300 feet long. The top width of the embankment is approximately 50 feet.

The spillway is a wooden drop inlet structure located near the right abutment of the dam. The outlet of the drop inlet consists of a 48-inch steel pipe embedded in the embankment and provided with a concrete retaining wall at the downstream end.

b. Location. Amphibious Lake Dam is located on Burlington County Route 545 (Texas Avenue) approximatley 3 miles south of Wrightstown, New Jersey. Route 545 is constructed on top of the embankment. The dam site is shown on the USGS Quadrangle entitled "Browns Mills, New Jersey" at coordinates N 39° 59.7', W 74° 36.1'. A regional location plan of Amphibious Lake Dam is enclosed as Plate 1, Appendix E.

c. Size Classification. Amphibious Lake Dam has a maximum height of approximately 13 feet which places it in the "Small" size dam category for height because it is less than 40 feet high. The dam has a maximum storage capacity of 38 acre-feet which places it in the "Small" size dam category for storage because it has a maximum storage less than 1,000 acre-feet. Therefore, the dam is in the "Small" size category.

d. Hazard Classification. There are no permanent structures for human habitation within the downstream area that could be affected by a failure of the dam. However, failure may cause appreciable damage to Route 545 and there could possibly be loss of life in the bivouac area in the valley downstream of the dam. Therefore, the dam should be placed in the "Significant" hazard category.

e. Ownership. The dam is owned by the United States Army. Records are maintained at the Directorate of Facilities Engineering, Building 5320, Fort Dix, New Jersey 08640.

f. Purpose of Dam. The dam was built to create a recreation lake.

g. Design and Construction History. Personnel at the Directorate of facilities Engineering were unable to locate any information pertaining to the design and construction of the dam. It appears that the impoundment may have been created subsequent to the construction of the Route 545 embankment, through the construction of a drop inlet spillway and the placing of additional fill along the upstream face of the roadway embankment.

h. Normal Operating Procedures. According to the Owner's representative, Mr. Harry E. Colbert, no operating procedures are in force at this dam.

1.3 Pertinent Data

a. Drainage Area. The drainage area of Amphibious Lake Dam is 0.40 square miles. Meadow Lake Dam is located just upstream of Amphibious Lake and has a drainage area of 0.29 square miles.

b. Discharge at Dam Site. No high pool or discharge records were made available. The spillway capacity at the low point of the top of dam is 27 cubic feet per second (cfs).

c. Elevation (feet above MSL).

Spillway Crest	115.0
Design Top of Dam	117.0
Low Point top of dam	116.9
Outlet Conduit Invert	103.5
Streambed at the downstream toe of the dam	104.0
Tailwater	±104.5

d. Reservoir (miles).

Length of Normal Pool	0.25
Length of Pool (top of dam)	0.35

e. Storage (acre-feet).

Normal Pool (Elev. 115.0)	18
Design Top of Dam (Elev. 117.0)	38

f. Reservoir Surface Area (acres).

Normal Pool (Elev. 115.0)	9

Design Top of Dam (Elev. 117.0)	11.0

g. Dam.

Type	Earth Embankment
Length	300 feet+
Height	13 feet (maximum)
Top width	50 feet+
Side Slope (approximately)	3H:1V to 2H:1V (upstream); 2H:1V to 1H:1V (downstream)
Zoning	Unknown
Impervious Core	Unknown
Cutoff	Unknown
Grout Curtain	Unknown

h. Diversion and Regulating Structure.

None

i. Spillway.

Type	Wooden drop inlet
Length of Weir	3 feet
Crest Elevation	115.0
Gates	None
Upstream Channel	None
Outlet Conduit	Steel pipe 48 inch diameter.

j. Regulating Outlets.

None

SECTION 2

ENGINEERING DATA

2.1 Design

a. Data Available. The engineering data made available by the Directorate of Facilities Engineering includes the following:

1. Extension of Amphibious Lake, dated April 4, 1963 (never implemented).

2. Contour Map of Amphibious Lake dated March 6, 1961.

3. Proposed spillway for Amphibious Lake dated March 7, 1961.

2.2 Construction

According to the Owner's representative, no information pertaining to the construction of this dam was available.

2.3 Operation

According to the Owner's representative, there are no operational features associated with this structure.

2.4 Evaluation

a. Availability. The engineering data utilized in this report was provided by the Directorate of Facilities Engineering, Fort Dix, New Jersey.

b. Adequacy. Although design information is minimal and there is no construction information, the conditions observed during the field inspection, information made available by the Directorate of Facilities Engineering, Fort Dix and conversations with the Owner's representative, appear to provide an adequate basis for a Phase I evaluation.

c. Validity. There is no reason to question the validity of the data made available.

SECTION 3

VISUAL INSPECTION

3.1 Findings

a. General. The field inspection of Amphibious Lake Dam took place on April 12, 1979. At the time of inspection, the water surface was approximately one inch above the crest of the drop inlet spillway.

b. Dam. During the visual survey, there were no indications or evidence observed of distortions in alignment or grade that would be indicative of movement of the embankment or the foundation. The upstream face of the dam has a sparse cover of grass, weeds, and small rocks and stones in some areas. The slope of the upstream face varies from about 3H:1V to 2H:1V.

Route 545 is constructed on top of the embankment. The downstream slope of the embankment is heavily overgrown with trees and bushes and the slope varies from approximately 2H:1V to 1H:1V.

As delineated on Plate 5, Appendix E some seepage was noted downstream of the dam.

c. Appurtenant Structures. The wooden drop inlet spillway appears to be in good condition, including the concrete retaining wall constructed at the downstream end of the 48-inch steel outlet pipe. The dam is not provided with a reservoir drain system.

d. Reservoir Area. The reservoir slopes are relatively flat varying between 2 and 10 percent with satisfactory vegetative cover. No significant slope stability problems are apparent along the periphery of the reservoir.

e. Downstream Channel. The spillway discharge channel is the natural channel of Newbold Run. The channel overbanks are heavily overgrown with trees and brush. A small unnamed impoundment is located on Newbold Run about 1.5 miles downstream of the dam.

There are no permanent structures of human habitation along the Newbold Run between Amphibious Lake Dam and the above mentioned impoundment. However, failure of Amphibious Lake Dam could cause appreciable damage to Route 545 and there could possible be loss of life in the bivouac area in the valley downstream of the dam.

SECTION 4

OPERATIONAL FEATURES

4.1 Procedures

Based on the review of information provided by the Directorate of Facilities Engineering and conversation with the Owner's representative, Mr. Harry E. Colbert, no formal operating procedures are established for Amphibious Lake Dam.

4.2 Maintenance of Dam

According to the Owner's representative, no maintenance procedures have been established for this dam.

4.3 Maintenance of Operating Facilities

According to the Owner's representative, there are no operational features associated with this dam.

4.4 Description of any Warning Systems in Effect

According to the Owner's representative, there is no formal warning system in effect for Amphibious Lake Dam.

4.5 Evaluation of Operational Adequacy

The reservoir can not be drawn down because the dam is not provided with a reservoir drain system.

The dam is accessible under all weather conditions.

SECTION 5

HYDRAULICS AND HYDROLOGY

5.1 Evaluation of Features

a. Design Data. Amphibious Lake Dam which has a drainage area of 0.4 square miles impounds a reservoir of 18 acre-feet at the spillway crest elevation of 115.0. The spillway facilities consist of a timber drop inlet with a three foot wide one sided weir and a steel outlet conduit 48-inches in diameter.

b. Experience Data. According to the Owner's representative, no records of reservoir level or rainfall are kept for this dam.

c. Visual Observations. The lack of a reservoir drain system could present a problem should a drawdown of the reservoir be required.

d. Overtopping Potential. The Spillway Design Flood (SDF) for this "Small" size, "Significant" hazard structure is given as a range from 100-year frequency to one-half of the Probable Maximum Flood (PMF). The SDF selected for use is 0.5 PMF. The SDF hydrograph was routed through the reservoir with the initial water surface Elevation 115.06. The maximum water surface elevation in the reservoir resulting from the SDF routing would be about 2.4 feet above the spillway crest elevation of 115.0 and about 0.5 feet above the low point of the top of the dam, Elevation 116.94. The low point of the dam crest was determined by a survey of the dam crest profile during the field investigation. The SDF routing has a peak inflow of 343 cfs and a peak outflow of 333 cfs. The spillway is capable of discharging 19 percent of the SDF without overtopping of the dam. Refer to Appendix C for computations and computer printouts.

e. Spillway Adequacy. The spillway is capable of discharging only 19 percent of the SDF (0.5 PMF) and is considered as "Inadequate" but not "Seriously Inadequate" because the structure is a "Small" size, "Significant" hazard dam.

Failure of the dam could cause appreciable damage to Route 545 and there could possibly be loss of life in the bivouac area in the valley downstream of the dam.

SECTION 6

STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations. On the date of the inspection, the embankment appeared to be in fair condition. There was no evidence of slope stabilty problems or unusual settlements. However, a marshy area with seepage and areas of discolored standing water was located along the downstream toe of the dam. The source of the water could not be determined, but could be the result of seepage through or beneath the embankment. The heavy cover of large trees and bushes on the downstream slope may increase the seepage potential through the embankment.

The spillway, including the concrete retaining wall constructed at the end of the 48 inch outlet pipe, appeared to be in good condition and showed no signs of instability.

b. Design and Construction Data. There is no construction and design data available.

c. Operating Records. According to the Owner's representative, Harry E. Colbert, there are no official operating records kept for this dam.

d. Post-Construction Changes. There is no record of any modifications subsequent to the completion of construction.

e. Seismic Stability. The dam is located in Seismic Risk Zone 1 of the "Seismic Zone Map of Contiguous States". A dam located in Seismic Zone 1 is generally considered to be safe under any expected earthquake loading if it is safe under static loading conditions.

SECTION 7

ASSESSMENT, RECOMMENDATIONS AND PROPOSED REMEDIAL MEASURES

7.1 Dam Assessment

a. Evaluation. Based on the visual inspection the Amphibious Lake Dam is considered to be in fair condition. The reservoir can not be drawn down since it is not provided with a reservoir drain system.

A marshy area with seepage and areas of discolored standing water was located along the downstream toe of the dam. The source of the water could not be determined during the visual inspection.

As stated in Section 5.1.d, the SDF selected is 50 percent of the PMF for this "Small" size, "Significant" hazard dam. Examination of the results of the hydrologic and hydraulic analyses indicates that the spillway is capable of passing approximately 19 percent of the SDF without overtopping of the earth embankment. The spillway is classified as "Inadequate" but not "Seriously Inadequate" because the dam is a "Small" size "Significant" hazard structure.

Failure of the structure by overtopping could cause appreciable damage to the Route 545 and there could possibly be loss of life in the bivouac area in the valley downstream of the dam.

b. Adequacy of Information. The information made available by the Directorate of Facilities Engineering, conversations with the Owner's representative, Harry E. Colbert, and observations made during the field investigation provided adequate data for a Phase I evaluation.

c. Urgency. The remedial measures recommended in Section 7.2 should be initiated soon.

d. Necessity for Further Investigation. Further detailed hydrologic and hydraulic studies should be made to determine the extent to which the spillway capacity should be increased.

7.2 Recommendations and Remedial Measures

1. The dam should be provided with a reservoir drain system.

2. The marshy area downstream of the embankment should be regraded to provide adequate drainage. Discharge from the area should be monitored to detect turbidity or increases in discharge.

3. The capacity of the spillway should be increased in accordance with the results of the hydrologic and hydraulic studies.

4. Trees and brush should be removed from the embankment and the areas where trees have been removed should be backfilled and regraded. The embankment slopes should be protected with vegetative cover or riprap.

b. Operation and Maintenance Procedures

1. The Owner should develop and implement a maintenance and inspection checklist to insure that all items associated with the structure are maintained on a regular basis.

2. The structure should be monitored during periods of heavy discharges. A warning system should be developed and implemented when necessary for the downstream area used for bivouac.

APPENDIX

A

Check List Engineering Data

Design, Construction, Operation

Phase I

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Amphibious Lake Dam

ID # NJ 00457

ITEM	REMARKS
AS-BUILT DRAWINGS	Not available
REGIONAL VICINITY MAP	Refer to Appendix E, Plate 1
CONSTRUCTION HISTORY	No information available
TYPICAL SECTIONS OF DAM	Not available for existing structure
OUTLETS - PLAN	No information available for existing structure
DETAILS	
CONSTRAINTS	
DISCHARGE RATINGS	None available
RAINFALL/RESERVOIR RECORDS	None available

ITEM	REMARKS
DESIGN REPORTS	No design reports available
GEOLOGY REPORTS	None provided. Refer to Appendix F of this report
DESIGN COMPUTATIONS	No data available
HYDROLOGY & HYDRAULICS	No data available
DAM STABILITY	No data available
SEEPAGE STUDIES	No data available
MATERIALS INVESTIGATIONS	
BORING RECORDS	
LABORATORY	No information available
FIELD	
POST-CONSTRUCTION SURVEYS OF DAM	None
BORROW SOURCES	There is no record of where borrow material came from.

ITEM	REMARKS
MONITORING SYSTEMS	None
MODIFICATIONS	None Noted
HIGH POOL RECORDS	None available
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None
MAINTENANCE OPERATION RECORDS	None available

ITEM	REMARKS
SPILLWAY PLAN SECTIONS DETAILS	There is no information on the existing spillway.
OPERATING EQUIPMENT PLANS & DETAILS	None available
MISCELLANEOUS	

APPENDIX

B

Check List

Visual Inspection

Phase I

CHECK LIST
VISUAL INSPECTION
PHASE I

Name Dam Amphibious Lake Dam County Burlington State New Jersey National ID #NJ 00457

Type of Dam Earth Hazard Category Significant

Date(s) Inspection 04/12/79 Weather Clear Temperature 60° F

Pool Elevation at Time of Inspection ± 115.1 M.S.L. Tailwater at Time of Inspection ± 104.5 M.S.L.

Inspection Personnel:

Mr. Lee DeHeer
Mr. Stefan Manea
Mr. David B. Campbell

Mr. David B. Campbell Recorder

Remarks:

Mr. Harry E. Colbert from the Directorate of Facilities Engineering was present at the time of the inspection (Fort Dix).

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None observed	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None observed	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	Small erosion channels were observed on the upstream slope.	The embankment faces should be protected with vegetative cover or riprap.
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	No apparent deformations observed.	
RIPRAP FAILURES	N/A	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	No discontinuities observed	
ANY NOTICEABLE SEEPAGE	A marshy area with seepage and areas of discolored standing water was located along the downstream toe of the dam.	This area should be regraded to provide adequate drainage. Flow should be monitored to detect turbidity or increases in flow.
STAFF GAGE AND RECORDER	None	
DRAINS	None observed	

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	None observed	
INTAKE STRUCTURE	Not observed beneath reservoir surface	
OUTLET STRUCTURE	48-inch diameter steel pipe	
OUTLET CHANNEL	Natural channel of Newbold Run with no outlet basin.	
EMERGENCY GATE	None	

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Timber box in good condition	
APPROACH CHANNEL	N/A	
DISCHARGE CHANNEL	The 48-inch diameter steel pipe spillway outlet discharges into the natural channel of Newbold Run.	
BRIDGE AND PIERS	None	

INSTRUMENTATION

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	NONE	
OBSERVATION WELLS	NONE	
WEIRS	NONE	
PIEZOMETERS	NONE	
OTHER	NONE	

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	The reservoir slopes are relatively flat (2 to 10 percent) and well vegetated around the entire perimeter of the reservoir.	
SEDIMENTATION	There does not appear to be any excessive accumulation of sediment in the reservoir. Because of the flat graients around the entire perimeter of the reservoir there is little sediment accumulation even though there is poor vegetative cover around the entire reservoir.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	The downstream channel is the natural channel of Newbold Run which flows through a heavily overgrown valley. There are numerous obstructions to flow.	
SLOPES	The channel is on a gradient of about 0.1 percent. The banks are heavily overgrown with trees and brush. Channel bank slopes vary anywhere from 1:1 to 10:1	
APPROXIMATE NO. OF HOMES AND POPULATION	There are no permanent structures for human habitation for more than 2 miles downstream of Amphibious Lake Dam. However, failure of Amphibious Lake Dam could cause appreciable damage to Route 545 and bivouac areas downstream.	The structure should be monitored during periods of heavy discharges. A warning system should be developed and implemented when necessary for the downstream area used for bivouac.

APPENDIX

C

Hydrologic & Hydraulic Data

TABLE OF CONTENTS - APPENDIX C

O'BRIEN & GERE

PROJECT	SHEET	BY	DATE	JOB NO
AMPHIBIOUS LAKE DAM	1	SM	4/26/79	1800.005.110

A. UPPER RESERVOIR

I. SCS CURVE NUMBER METHOD

$$T_l = \frac{L^{0.8}(S+1)^{0.7}}{1900\, Y^{0.5}}$$

$L = 6000$ ft

$$S = \frac{1000}{CN} - 10 = \frac{1000}{70} - 10 = 4.29$$

(CN = Runoff curve number)

$$Y = \frac{170 - 121}{6000} = 0.0083 = 0.83\%$$

$$T_l = \frac{6000^{0.8}(4.29+1)^{0.7}}{1900 \times 0.83^{0.5}} = \underline{\underline{2.0}} \text{ hrs}$$

O'BRIEN & GERE

ECT	SHEET	BY	DATE	JOB NO
Amphibious Lake Dam	2	SM	4/26/79	1600.005.110

II. BUREAU OF PUBLIC ROADS

$$T_c = \left(\frac{11.9 \times L^3}{H} \right)^{0.385}$$

L = hydraulic length of watershed (miles)

L = 6000 ~~ft~~ = 1.14 mile

H = basin relief (~~feet~~)

H = 49 ~~ft~~

$$T_c = \left(\frac{11.9 \times 1.14^3}{49} \right)^{0.385} = 0.7 \text{ hrs} \quad \text{Say } 1 \text{ hr}$$

$$T_l = 0.6 \times T_c = \underline{0.6 \text{ hrs}}$$

III. KIRPICH EQUATION [1]

$$T_c = 0.00013 \frac{L^{.77}}{S^{.385}}$$

L = the length of the longest waterway from the outlet, in feet.

S = the slope of the channel, in ft/ft

T_c = the time of concentration, in hours.

$$S = \frac{49}{6000} = 0.008$$

$$T_c = 0.00013 \frac{6000^{0.77}}{0.008^{0.385}} = 0.68 \text{ hrs.}$$

Say 1 hr.

$$T_l = 0.6 \times T_c = 0.6 \text{ hrs}$$

1) Kirpich, Z.P. "Time of concentration of small agricultural watersheds", Civil Engr. V. 10, No. 6 p. 362, June 1940. Also in E.F. Shulz: Problems in Applied Hydrology, Water Resources Publications, Fort Collins, Colorado, 1976

O'BRIEN & GERE

PROJECT	SHEET	BY	DATE	JOB NO
Amphibious Lake Dam	4	SM	7/16/79	1800.005.110

Since SCS Curve Number Method gives a result that differs too much from those obtained with the other two methods it seems reasonable to take in consideration only the values obtained with Kirpich and Bureau of Public Roads methods.

So,

$$T_c = 0.6 \text{ hrs.}$$

O'BRIEN & GERE

JECT	SHEET	BY	DATE	JOB NO
Amphibious Lake Dam	5	SM	4/26/79	1800.005.110

B. LOWER RESERVOIR

I. SCS CURVE NUMBER METHOD

$$T_c = \frac{L^{0.8}(S+1)^{0.7}}{1900\, Y^{0.5}}$$

$L = 1600$ ft

$$S = \frac{1000}{CN} - 10 = 4.29$$

$$Y = \frac{116-115}{1600} = 0.0006 = 0.06\%$$

$$T_c = \frac{1600^{0.8}(4.29+1)^{0.7}}{1900 \times 0.06^{0.5}} = 2.5 \text{ hrs}$$

O'BRIEN & GERE

JECT	SHEET	BY	DATE	JOB NO.
Knightsville Lake Dam	6	SM	4/26/79	1800.005.110

II. BUREAU OF PUBLIC ROADS

$$T_c = \left(\frac{11.9 \times L^3}{H} \right)^{0.385}$$

$L = 1600 \text{ ft} = 0.3 \text{ mile}$

$H = 116 - 115 = 1 \text{ ft}$

$$T_c = \left(\frac{11.9 \times 0.3^3}{1} \right)^{0.385} \approx 1.0 \text{ hrs}$$

$$T_L = 0.6 \times T_c \approx 0.6 \text{ hrs.}$$

O'BRIEN & GERE

JECT	SHEET	BY	DATE	JOB NO.
Amabilis Lake Dam	7	SM	July 16, 74	1600-005-110

III. KIRPICH EQUATION

$$T_c = 0.00013 \frac{L^{0.77}}{S^{0.385}}$$

$L = 1600$ ft

$$S = \frac{5}{1600} = 0.003$$

$$T_c = 0.00013 \frac{1600^{0.77}}{0.003^{0.385}} \approx 0.5 \text{ hrs}$$

$$T_l = 0.6 \times T_c = 0.3 \text{ hrs}$$

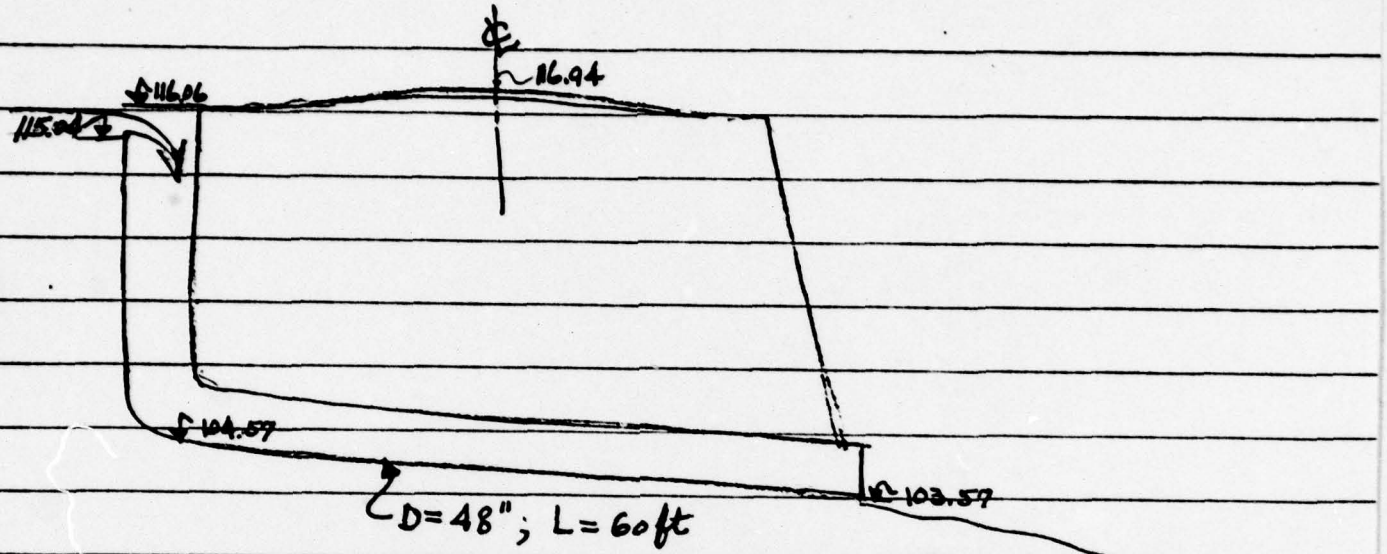
Based on the same judgment we did for the upper reservoir,

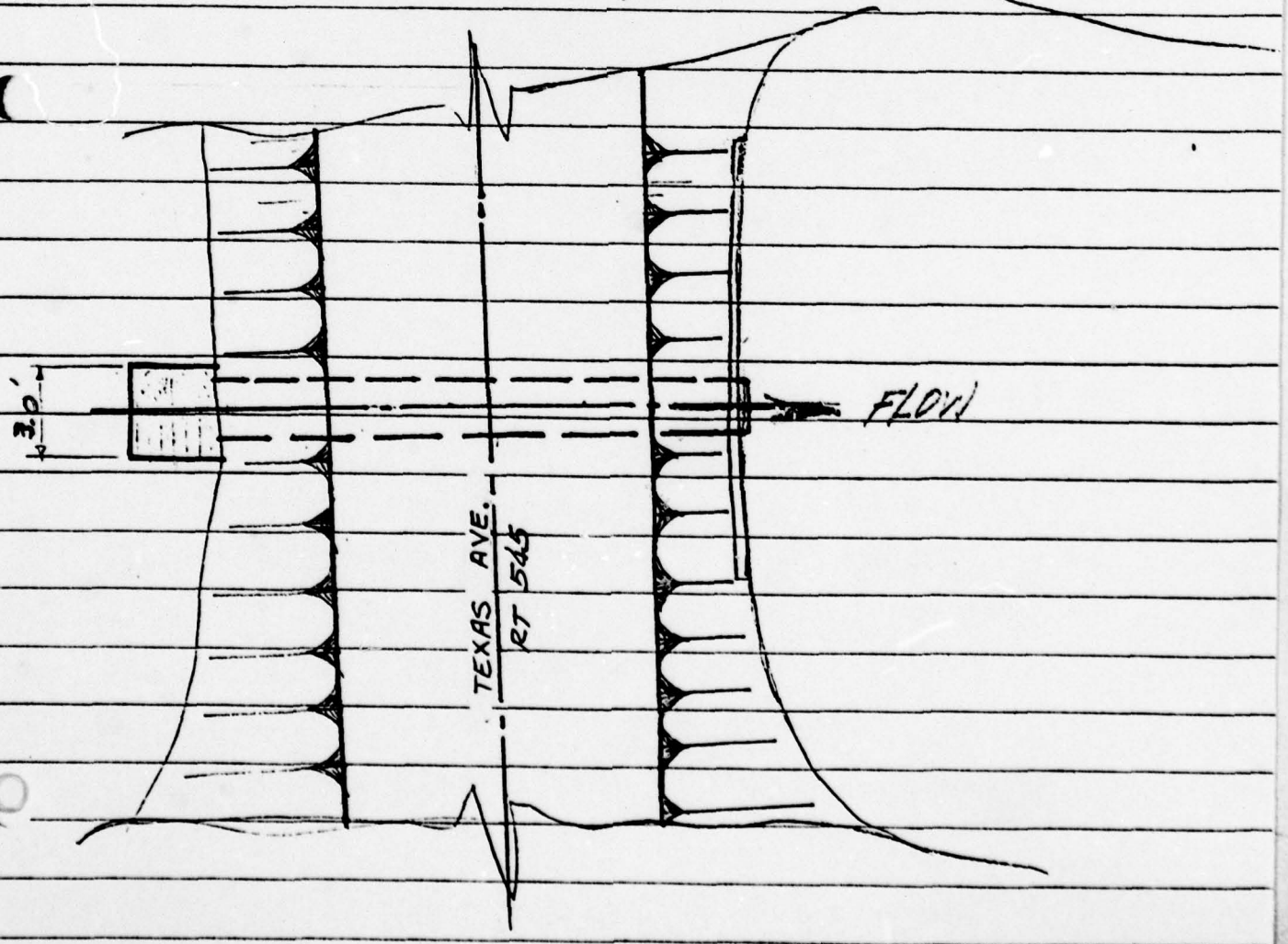
$$T_l = \frac{0.6 + 0.3}{2} \simeq 0.5 \text{ hrs}$$

O'BRIEN & GERE

JECT	SHEET	BY	DATE	JOB NO
Amphibious Lake Dam	8	SM	4/20/79	1800.005.110

AMPHIBIOUS LAKE DAM





O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
Amphibious Lake Dam	9	SM	4/20/79	1800.005.110

I. CREST DISCHARGE/CONTROL

$$Q = C L H^{3/2}$$

$$Q = 0.34 \times 3 \times 2^{3/2} \approx 3.0 \text{ cfs}$$

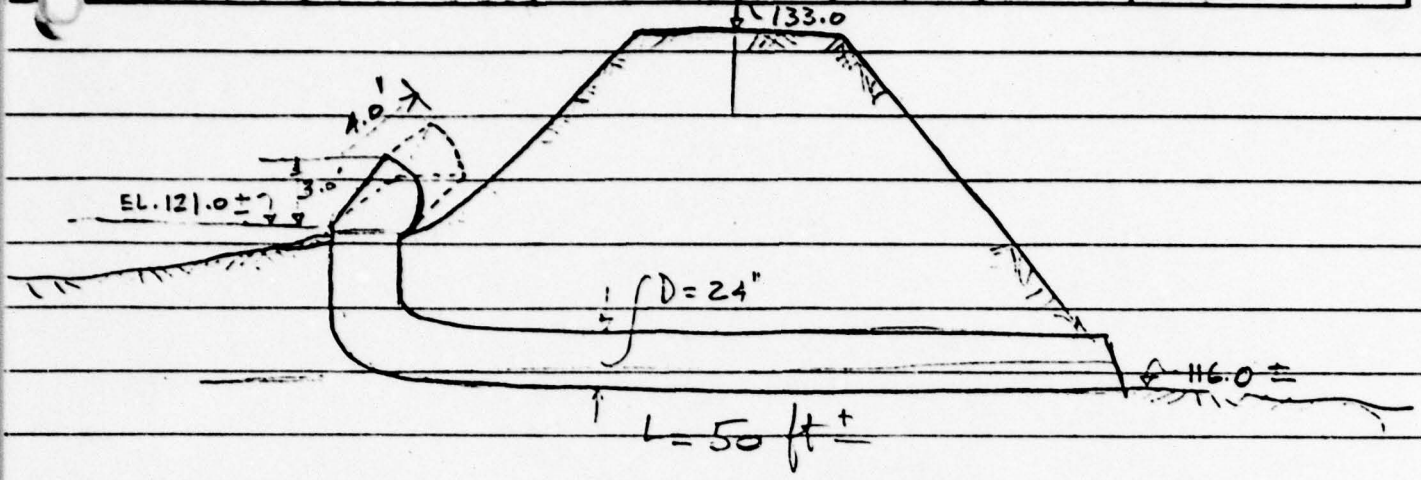
Therefore, it is obvious* that the flow phenomenon that would always occur is that of weir flow type; the orifice flow or the full pipe flow would never occure in the existing circumstances. Consequently, although the spillway is of a drop inlet type, it should be modeled as a simple sharp-crested weir.

* because: For small heads, flow over the drop inlet spillway is governed by the characteristics of crest discharge. In our case the max. available head (2 ft) would never give a flow higher than that related to a 0.7* full pipe at d/s end, which is about 130 cfs

* Crest control condition generally prevails for heads at which tunnel flows approx. 0.7 full at d/s end.

O'BRIEN & GERE (THE UPPER RESERVOIR)

OBJECT	SHEET	BY	DATE	JOB NO
Amphibious Lake Dam	10	SM	4/25/79	1800-025-110



I CREST DISCHARGE (CONDITION I)

$Q = C L H^{3/2}$

Equiv. Circular ⇒ 3.5

$R_s = 1.75$

$$Q = C_o (2\pi R_s) H_o^{3/2}$$

$$C_o = \frac{Q}{2\pi R_s H_o^{3/2}}$$

$\frac{H_o}{R_s} = 0.45$ ⇒ the limit up to which weir control governs.

$$\frac{P}{R_s} = \frac{2.0}{1.75} = 1.14$$

From fig. 283 page 417 – Design of Small Dams, U.S. Civ. of E will result:

O'BRIEN & GERE

JECT	SHEET	BY	DATE	JOB NO
Amphibious Lake Dam	11	SM	4/25/79	1800-005-110

Elev.	H_o/R_s	$H_o \approx H$	$C_o = \frac{Q}{2\pi R_s H_o^{3/2}}$	$Q = C_o (2\pi R_s) H_o^{3/2}$
121.17	0.1	0.175	4.0	3.2
121.35	0.2	0.35	3.9	8.9
121.53	0.3	0.525	3.75	15.7
121.7	0.4	0.70	3.56	22.9

II. ORIFICE CONTROL (THROAT CONTROL)

$$Q = \left(\frac{R_t}{0.204}\right)^2 H_a^{1/2} \qquad R_t = 1$$

$H_o \approx H$ (ft)	H_a	$Q = \left(\frac{R_t}{0.204}\right)^2 H_a^{1/2}$ (cfs)	Elev.
1.0	2.0	33.8	122.0
2.0	3.0	41.5	123.0

O'BRIEN & GERE

JECT	SHEET	BY	DATE	JOB NO
Amphibious Lake Dam	12	SM	4/25/79	1800.005.110

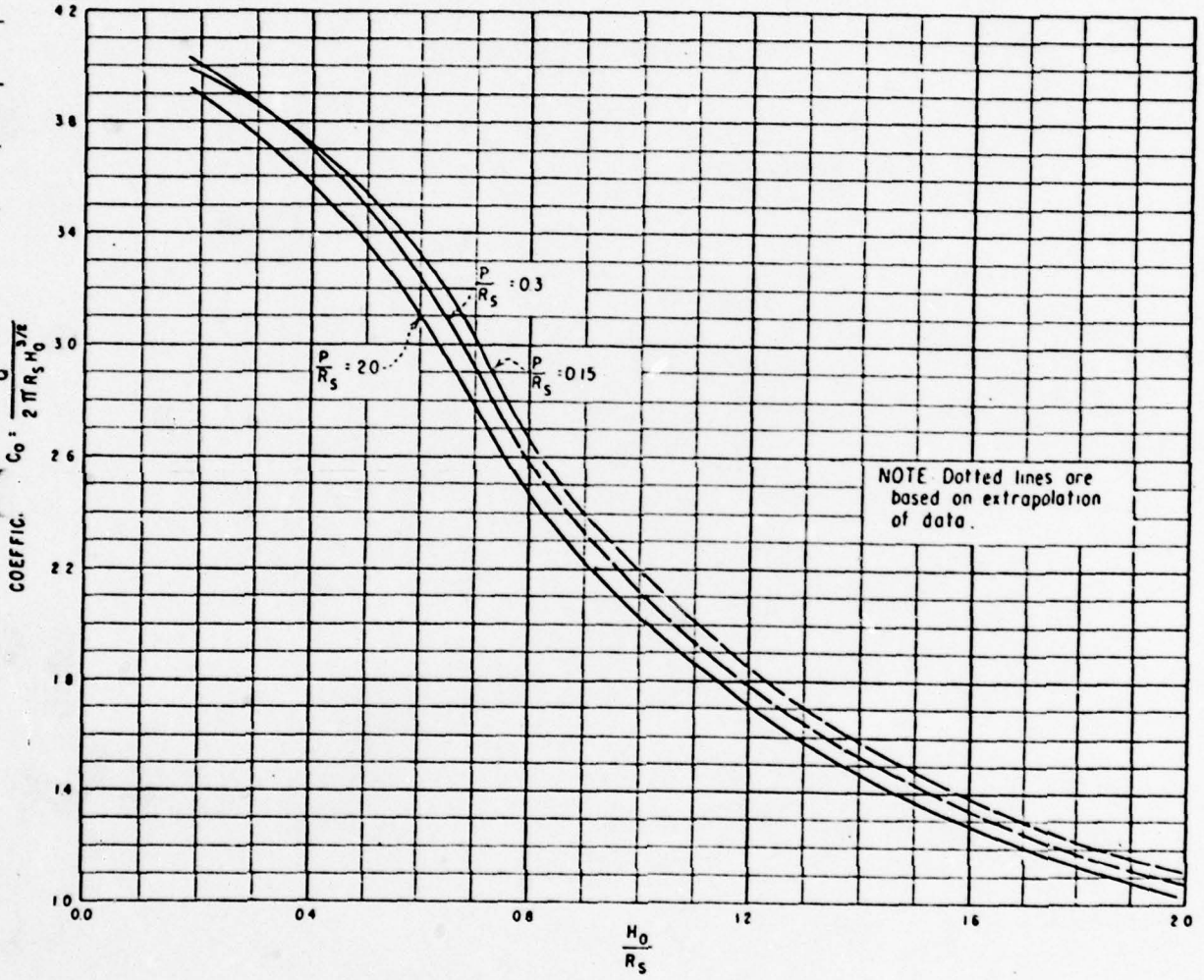


Figure 283. Relationship of circular crest coefficient C_o to $\frac{H_o}{R_s}$ for different approach depths (aerated nappe). 288–D–2441.

From B. of Reclamation - Design of Small Dams.

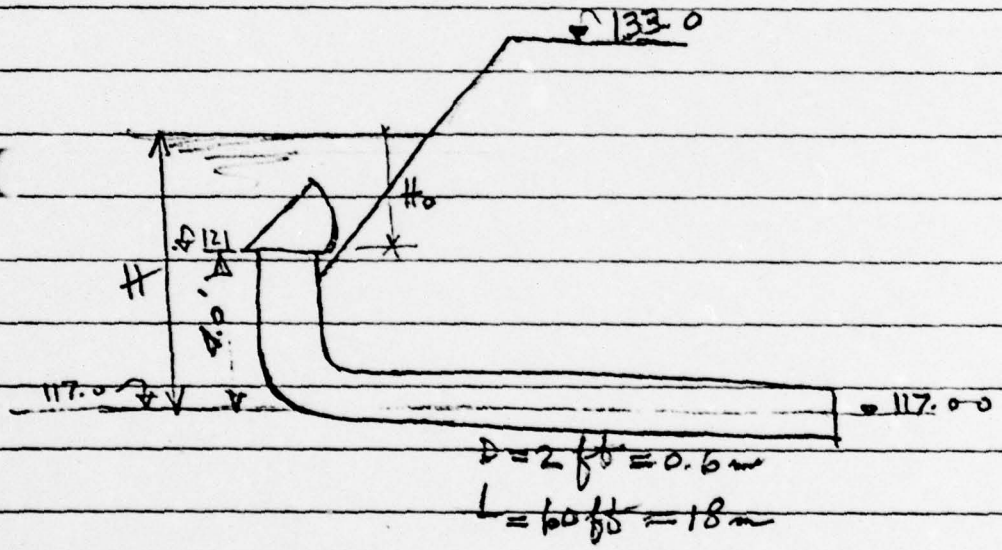
O'BRIEN & GERE

JECT	SHEET	BY	DATE	JOB NO
Amphitheater Lake Dam	13	SM	4/25/79	1890.005.110

III. FULL PIPE FLOW

$$\left(Q_{full}\right)_o = K_{1,full}\sqrt{S} = 3.3 \times \sqrt{0.02} = 0.47\ m^3/sec =$$

$$= 0.47 \times 35.31 = 16.6\ cfs$$



O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
Amphibious Lake Dam	14	SM	4/25/79	1320.005.110

$$Q = VA = \varphi \sqrt{2g H^*}\, A$$

$$\varphi = \frac{1}{\sqrt{\alpha + \xi_f}}$$

$$\xi_f = \frac{f L}{D}$$

$$f = \frac{0.021}{D^{0.3}} \approx 0.024 \quad \text{(complete turbulence)}$$

$$\xi_f = \frac{0.024 \times 18}{0.6} = 0.72$$

$$\varphi = \frac{1}{\sqrt{1.1 + 0.72}} = 0.74$$

$$Q = 0.74 \sqrt{19.62} \times \frac{\pi 0.6^2}{4} \sqrt{H^*}$$

$$Q = 3.27 \times 0.28 \sqrt{H^*}$$

$$\boxed{Q = 0.9 \sqrt{H^*}}$$

O'BRIEN & GERE

SUBJECT	SHEET	BY	DATE	JOB NO
Amphibious Lake Dam	15	SH	4/25/79	1800.025.110

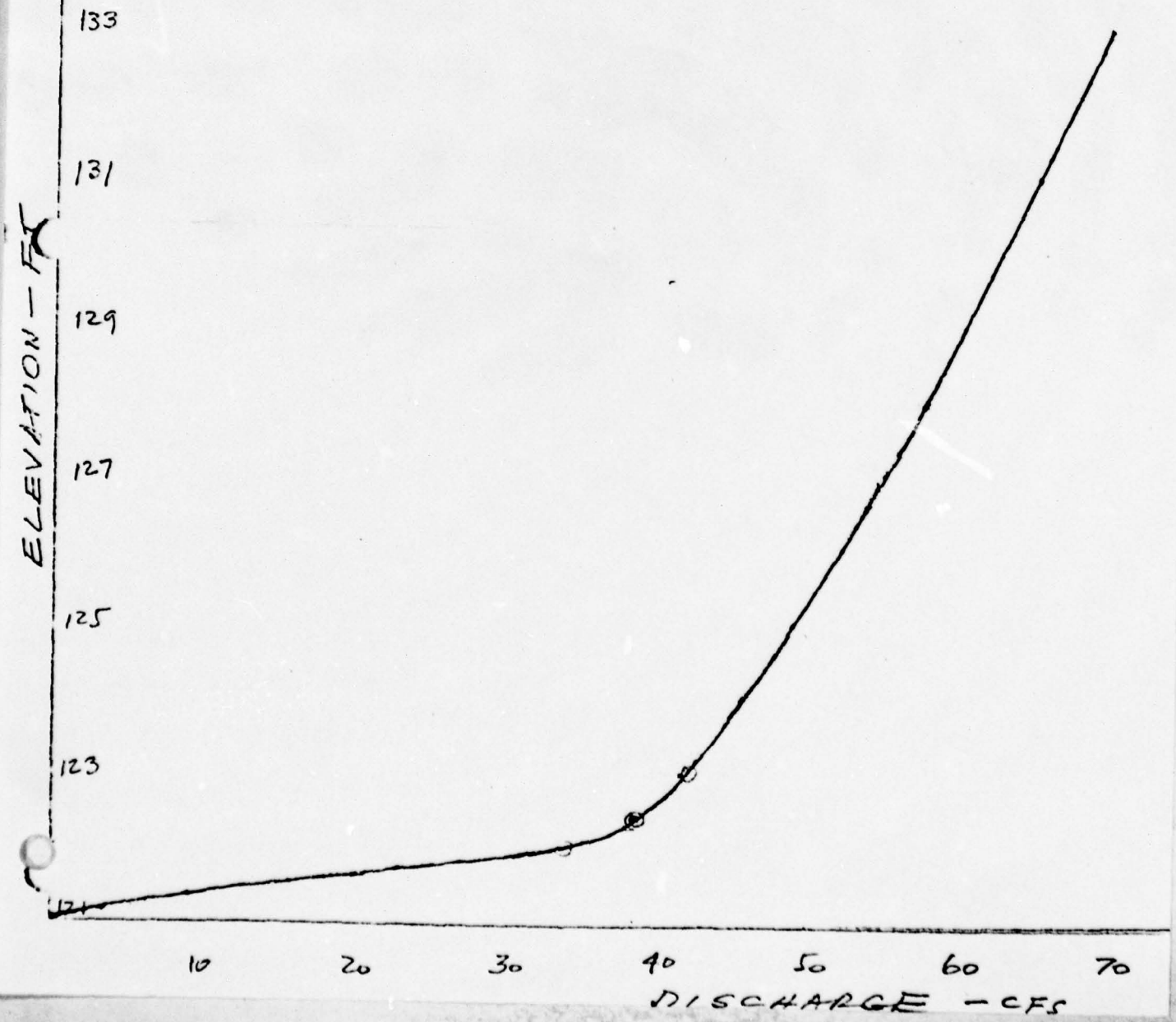
H_o (ft)	H^* (ft)	H^* (m)	$Q = 0.9\sqrt{H^*}$ m^3/sec	Q (cfs)	Elev.
3	7	2.1	1.3	45.9	124
4	8	2.4	1.39	49.0	125
5	9	2.7	1.478	52.21	126
6	10	3.0	1.56	55.0	127
7	11	3.3	1.63	57.7	128
8					
9					
10	14	4.2	1.84	65.0	131
11					
12	16	4.8	1.97	69.6	133

Sh 16

AMPHIBIOUS LAKE DAM
SPILLWAY DISCHARGE CAPACITY
OF THE RESERVOIR D/S OF
PEMBERTON RD.

(UPPER RESERVOIR)

SM
4/25/79



****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79
****

RUN DATE= 07/17/79.
TIME= 07.54.08.

NATIONAL DAM INSPECTION PROGRAM
AMPHIBIOUS LAKE DAM
PMF HYDROGRAPH

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
300	0	15	0	0	0	0	0	3	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 5 LRTIO= 1
RTIOS= .10 .20 .30 .40 .50

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

RUNOFF TO UPPER RESERVOIR

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
INFLOW=		0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	.29	0.00	.40	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	23.50	113.00	123.00	132.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LKOPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA
TC= 0.00 LAG= .60

RECESSION DATA
STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

SH 17

UNIT HYDROGRAPH 14 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= .60 VOL= 1.00

67.	155.	193.	154.	86.	49.	28.	16.	9.	5.
3.	2.	1.	0.						

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q

1.01	.15	1	.00	0.00	.00	0.	1.02	13.45	151	.64	.62	.01	413.
1.01	.30	2	.00	0.00	.00	0.	1.02	14.00	152	.64	.62	.01	437.
1.01	.45	3	.00	0.00	.00	0.	1.02	14.15	153	.80	.78	.01	458.
1.01	1.00	4	.00	0.00	.00	0.	1.02	14.30	154	.80	.78	.01	490.
1.01	1.15	5	.00	0.00	.00	0.	1.02	14.45	155	.80	.78	.01	525.
1.01	1.30	6	.00	0.00	.00	0.	1.02	15.00	156	.80	.78	.01	552.
1.01	1.45	7	.00	0.00	.00	0.	1.02	15.15	157	.81	.79	.01	568.
1.01	2.00	8	.00	0.00	.00	0.	1.02	15.30	158	1.61	1.60	.01	616.
1.01	2.15	9	.00	0.00	.00	0.	1.02	15.45	159	4.52	4.51	.01	885.
1.01	2.30	10	.00	0.00	.00	0.	1.02	16.00	160	1.13	1.12	.01	1336.
1.01	2.45	11	.00	0.00	.00	0.	1.02	16.15	161	.74	.73	.01	1478.
1.01	3.00	12	.00	0.00	.00	0.	1.02	16.30	162	.74	.73	.01	1283.
1.01	3.15	13	.00	0.00	.00	0.	1.02	16.45	163	.74	.73	.01	976.
1.01	3.30	14	.00	0.00	.00	0.	1.02	17.00	164	.74	.73	.01	792.
1.01	3.45	15	.00	0.00	.00	0.	1.02	17.15	165	.58	.57	.01	679.
1.01	4.00	16	.00	0.00	.00	0.	1.02	17.30	166	.58	.57	.01	595.
1.01	4.15	17	.00	0.00	.00	0.	1.02	17.45	167	.58	.57	.01	530.
1.01	4.30	18	.00	0.00	.00	0.	1.02	18.00	168	.58	.57	.01	486.
1.01	4.45	19	.00	0.00	.00	0.	1.02	18.15	169	.04	.03	.01	435.
1.01	5.00	20	.00	0.00	.00	0.	1.02	18.30	170	.04	.03	.01	337.
1.01	5.15	21	.00	0.00	.00	0.	1.02	18.45	171	.04	.03	.01	224.
1.01	5.30	22	.00	0.00	.00	0.	1.02	19.00	172	.04	.03	.01	135.
1.01	5.45	23	.00	0.00	.00	0.	1.02	19.15	173	.04	.03	.01	86.
1.01	6.00	24	.00	0.00	.00	0.	1.02	19.30	174	.04	.03	.01	71.
1.01	6.15	25	.01	0.00	.01	0.	1.02	19.45	175	.04	.03	.01	66.
1.01	6.30	26	.01	0.00	.01	0.	1.02	20.00	176	.04	.03	.01	62.
1.01	6.45	27	.01	0.00	.01	0.	1.02	20.15	177	.04	.03	.01	58.
1.01	7.00	28	.01	0.00	.01	0.	1.02	20.30	178	.04	.03	.01	54.
1.01	7.15	29	.01	0.00	.01	0.	1.02	20.45	179	.04	.03	.01	50.
1.01	7.30	30	.01	0.00	.01	0.	1.02	21.00	180	.04	.03	.01	47.
1.01	7.45	31	.01	0.00	.01	0.	1.02	21.15	181	.04	.03	.01	44.
1.01	8.00	32	.01	0.00	.01	0.	1.02	21.30	182	.04	.03	.01	41.
1.01	8.15	33	.01	0.00	.01	0.	1.02	21.45	183	.04	.03	.01	38.
1.01	8.30	34	.01	0.00	.01	0.	1.02	22.00	184	.04	.03	.01	36.
1.01	8.45	35	.01	0.00	.01	0.	1.02	22.15	185	.04	.03	.01	33.
1.01	9.00	36	.01	0.00	.01	0.	1.02	22.30	186	.04	.03	.01	31.
1.01	9.15	37	.01	0.00	.01	0.	1.02	22.45	187	.04	.03	.01	29.
1.01	9.30	38	.01	0.00	.01	0.	1.02	23.00	188	.04	.03	.01	27.
1.01	9.45	39	.01	0.00	.01	0.	1.02	23.15	189	.04	.03	.01	25.
1.01	10.00	40	.01	0.00	.01	0.	1.02	23.30	190	.04	.03	.01	23.
1.01	10.15	41	.01	0.00	.01	0.	1.02	23.45	191	.04	.03	.01	22.
1.01	10.30	42	.01	0.00	.01	0.	1.03	0.00	192	.04	.03	.01	22.
1.01	10.45	43	.01	0.00	.01	0.	1.03	.15	193	0.00	0.00	0.00	21.
1.01	11.00	44	.01	0.00	.01	0.	1.03	.30	194	0.00	0.00	0.00	19.
1.01	11.15	45	.01	0.00	.01	0.	1.03	.45	195	0.00	0.00	0.00	18.
1.01	11.30	46	.01	0.00	.01	0.	1.03	1.00	196	0.00	0.00	0.00	17.
1.01	11.45	47	.01	0.00	.01	0.	1.03	1.15	197	0.00	0.00	0.00	16.
1.01	12.00	48	.01	0.00	.01	0.	1.03	1.30	198	0.00	0.00	0.00	15.
1.01	12.15	49	.04	0.00	.04	0.	1.03	1.45	199	0.00	0.00	0.00	14.
1.01	12.30	50	.04	0.00	.04	0.	1.03	2.00	200	0.00	0.00	0.00	13.
1.01	12.45	51	.04	0.00	.04	0.	1.03	2.15	201	0.00	0.00	0.00	12.
1.01	13.00	52	.04	0.00	.04	0.	1.03	2.30	202	0.00	0.00	0.00	11.
1.01	13.15	53	.05	0.00	.05	0.	1.03	2.45	203	0.00	0.00	0.00	10.
1.01	13.30	54	.05	0.00	.05	0.	1.03	3.00	204	0.00	0.00	0.00	10.
1.01	13.45	55	.05	0.00	.05	0.	1.03	3.15	205	0.00	0.00	0.00	9.
1.01	14.00	56	.05	0.00	.05	0.	1.03	3.30	206	0.00	0.00	0.00	8.
1.01	14.15	57	.06	0.00	.06	0.	1.03	3.45	207	0.00	0.00	0.00	8.
1.01	14.30	58	.06	0.00	.06	0.	1.03	4.00	208	0.00	0.00	0.00	7.
1.01	14.45	59	.06	0.00	.06	0.	1.03	4.15	209	0.00	0.00	0.00	7.
1.01	15.00	60	.06	0.00	.06	0.	1.03	4.30	210	0.00	0.00	0.00	6.
1.01	15.15	61	.06	0.00	.06	0.	1.03	4.45	211	0.00	0.00	0.00	6.

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1.01	15.30	62	.12	0.00	.12	0.	1.03	5.00	212	0.00	0.00	0.00	6.
1.01	15.45	63	.34	.30	.04	14.	1.03	5.15	213	0.00	0.00	0.00	5.
1.01	16.00	64	.09	.07	.01	51.	1.03	5.30	214	0.00	0.00	0.00	5.
1.01	16.15	65	.06	.04	.01	72.	1.03	5.45	215	0.00	0.00	0.00	5.
1.01	16.30	66	.06	.04	.01	70.	1.03	6.00	216	0.00	0.00	0.00	4.
1.01	16.45	67	.06	.04	.01	55.	1.03	6.15	217	0.00	0.00	0.00	4.
1.01	17.00	68	.06	.04	.01	45.	1.03	6.30	218	0.00	0.00	0.00	4.
1.01	17.15	69	.04	.03	.01	39.	1.03	6.45	219	0.00	0.00	0.00	3.
1.01	17.30	70	.04	.03	.01	34.	1.03	7.00	220	0.00	0.00	0.00	3.
1.01	17.45	71	.04	.03	.01	30.	1.03	7.15	221	0.00	0.00	0.00	3.
1.01	18.00	72	.04	.03	.01	28.	1.03	7.30	222	0.00	0.00	0.00	3.
1.01	18.15	73	.00	0.00	.00	24.	1.03	7.45	223	0.00	0.00	0.00	3.
1.01	18.30	74	.00	0.00	.00	19.	1.03	8.00	224	0.00	0.00	0.00	2.
1.01	18.45	75	.00	0.00	.00	12.	1.03	8.15	225	0.00	0.00	0.00	2.
1.01	19.00	76	.00	0.00	.00	7.	1.03	8.30	226	0.00	0.00	0.00	2.
1.01	19.15	77	.00	0.00	.00	4.	1.03	8.45	227	0.00	0.00	0.00	2.
1.01	19.30	78	.00	0.00	.00	3.	1.03	9.00	228	0.00	0.00	0.00	2.
1.01	19.45	79	.00	0.00	.00	3.	1.03	9.15	229	0.00	0.00	0.00	2.
1.01	20.00	80	.00	0.00	.00	3.	1.03	9.30	230	0.00	0.00	0.00	2.
1.01	20.15	81	.00	0.00	.00	3.	1.03	9.45	231	0.00	0.00	0.00	1.
1.01	20.30	82	.00	0.00	.00	3.	1.03	10.00	232	0.00	0.00	0.00	1.
1.01	20.45	83	.00	0.00	.00	2.	1.03	10.15	233	0.00	0.00	0.00	1.
1.01	21.00	84	.00	0.00	.00	2.	1.03	10.30	234	0.00	0.00	0.00	1.
1.01	21.15	85	.00	0.00	.00	2.	1.03	10.45	235	0.00	0.00	0.00	1.
1.01	21.30	86	.00	0.00	.00	2.	1.03	11.00	236	0.00	0.00	0.00	1.
1.01	21.45	87	.00	0.00	.00	2.	1.03	11.15	237	0.00	0.00	0.00	1.
1.01	22.00	88	.00	0.00	.00	2.	1.03	11.30	238	0.00	0.00	0.00	1.
1.01	22.15	89	.00	0.00	.00	2.	1.03	11.45	239	0.00	0.00	0.00	1.
1.01	22.30	90	.00	0.00	.00	1.	1.03	12.00	240	0.00	0.00	0.00	1.
1.01	22.45	91	.00	0.00	.00	1.	1.03	12.15	241	0.00	0.00	0.00	1.
1.01	23.00	92	.00	0.00	.00	1.	1.03	12.30	242	0.00	0.00	0.00	1.
1.01	23.15	93	.00	0.00	.00	1.	1.03	12.45	243	0.00	0.00	0.00	1.
1.01	23.30	94	.00	0.00	.00	1.	1.03	13.00	244	0.00	0.00	0.00	1.
1.01	23.45	95	.00	0.00	.00	1.	1.03	13.15	245	0.00	0.00	0.00	1.
1.02	0.00	96	.00	0.00	.00	1.	1.03	13.30	246	0.00	0.00	0.00	1.
1.02	.15	97	.03	.02	.01	1.	1.03	13.45	247	0.00	0.00	0.00	0.
1.02	.30	98	.03	.02	.01	3.	1.03	14.00	248	0.00	0.00	0.00	0.
1.02	.45	99	.03	.02	.01	6.	1.03	14.15	249	0.00	0.00	0.00	0.
1.02	1.00	100	.03	.02	.01	9.	1.03	14.30	250	0.00	0.00	0.00	0.
1.02	1.15	101	.03	.02	.01	10.	1.03	14.45	251	0.00	0.00	0.00	0.
1.02	1.30	102	.03	.02	.01	11.	1.03	15.00	252	0.00	0.00	0.00	0.
1.02	1.45	103	.03	.02	.01	11.	1.03	15.15	253	0.00	0.00	0.00	0.
1.02	2.00	104	.03	.02	.01	11.	1.03	15.30	254	0.00	0.00	0.00	0.
1.02	2.15	105	.03	.02	.01	12.	1.03	15.45	255	0.00	0.00	0.00	0.
1.02	2.30	106	.03	.02	.01	12.	1.03	16.00	256	0.00	0.00	0.00	0.
1.02	2.45	107	.03	.02	.01	12.	1.03	16.15	257	0.00	0.00	0.00	0.
1.02	3.00	108	.03	.02	.01	12.	1.03	16.30	258	0.00	0.00	0.00	0.
1.02	3.15	109	.03	.02	.01	12.	1.03	16.45	259	0.00	0.00	0.00	0.
1.02	3.30	110	.03	.02	.01	12.	1.03	17.00	260	0.00	0.00	0.00	0.
1.02	3.45	111	.03	.02	.01	12.	1.03	17.15	261	0.00	0.00	0.00	0.
1.02	4.00	112	.03	.02	.01	12.	1.03	17.30	262	0.00	0.00	0.00	0.
1.02	4.15	113	.03	.02	.01	12.	1.03	17.45	263	0.00	0.00	0.00	0.
1.02	4.30	114	.03	.02	.01	12.	1.03	18.00	264	0.00	0.00	0.00	0.
1.02	4.45	115	.03	.02	.01	12.	1.03	18.15	265	0.00	0.00	0.00	0.
1.02	5.00	116	.03	.02	.01	12.	1.03	18.30	266	0.00	0.00	0.00	0.
1.02	5.15	117	.03	.02	.01	12.	1.03	18.45	267	0.00	0.00	0.00	0.
1.02	5.30	118	.03	.02	.01	12.	1.03	19.00	268	0.00	0.00	0.00	0.
1.02	5.45	119	.03	.02	.01	12.	1.03	19.15	269	0.00	0.00	0.00	0.
1.02	6.00	120	.03	.02	.01	12.	1.03	19.30	270	0.00	0.00	0.00	0.
1.02	6.15	121	.08	.07	.01	14.	1.03	19.45	271	0.00	0.00	0.00	0.
1.02	6.30	122	.08	.07	.01	22.	1.03	20.00	272	0.00	0.00	0.00	0.
1.02	6.45	123	.08	.07	.01	32.	1.03	20.15	273	0.00	0.00	0.00	0.

Sh 19

1.02	7.00	124	.08	.07	.01	39.	1.03	20.30	274	0.00	0.00	0.00	0.
1.02	7.15	125	.08	.07	.01	44.	1.03	20.45	275	0.00	0.00	0.00	0.
1.02	7.30	126	.08	.07	.01	46.	1.03	21.00	276	0.00	0.00	0.00	0.
1.02	7.45	127	.08	.07	.01	47.	1.03	21.15	277	0.00	0.00	0.00	0.
1.02	8.00	128	.08	.07	.01	48.	1.03	21.30	278	0.00	0.00	0.00	0.
1.02	8.15	129	.08	.07	.01	49.	1.03	21.45	279	0.00	0.00	0.00	0.
1.02	8.30	130	.08	.07	.01	49.	1.03	22.00	280	0.00	0.00	0.00	0.
1.02	8.45	131	.08	.07	.01	49.	1.03	22.15	281	0.00	0.00	0.00	0.
1.02	9.00	132	.08	.07	.01	49.	1.03	22.30	282	0.00	0.00	0.00	0.
1.02	9.15	133	.08	.07	.01	49.	1.03	22.45	283	0.00	0.00	0.00	0.
1.02	9.30	134	.08	.07	.01	49.	1.03	23.00	284	0.00	0.00	0.00	0.
1.02	9.45	135	.08	.07	.01	49.	1.03	23.15	285	0.00	0.00	0.00	0.
1.02	10.00	136	.08	.07	.01	49.	1.03	23.30	286	0.00	0.00	0.00	0.
1.02	10.15	137	.08	.07	.01	49.	1.03	23.45	287	0.00	0.00	0.00	0.
1.02	10.30	138	.08	.07	.01	49.	1.04	0.00	288	0.00	0.00	0.00	0.
1.02	10.45	139	.08	.07	.01	49.	1.04	.15	289	0.00	0.00	0.00	0.
1.02	11.00	140	.08	.07	.01	49.	1.04	.30	290	0.00	0.00	0.00	0.
1.02	11.15	141	.08	.07	.01	49.	1.04	.45	291	0.00	0.00	0.00	0.
1.02	11.30	142	.08	.07	.01	49.	1.04	1.00	292	0.00	0.00	0.00	0.
1.02	11.45	143	.08	.07	.01	49.	1.04	1.15	293	0.00	0.00	0.00	0.
1.02	12.00	144	.08	.07	.01	49.	1.04	1.30	294	0.00	0.00	0.00	0.
1.02	12.15	145	.53	.52	.01	71.	1.04	1.45	295	0.00	0.00	0.00	0.
1.02	12.30	146	.53	.52	.01	141.	1.04	2.00	296	0.00	0.00	0.00	0.
1.02	12.45	147	.53	.52	.01	228.	1.04	2.15	297	0.00	0.00	0.00	0.
1.02	13.00	148	.53	.52	.01	298.	1.04	2.30	298	0.00	0.00	0.00	0.
1.02	13.15	149	.64	.62	.01	342.	1.04	2.45	299	0.00	0.00	0.00	0.
1.02	13.30	150	.64	.62	.01	380.	1.04	3.00	300	0.00	0.00	0.00	0.
									SUM	26.70	24.30	2.40	18730.
										(678.)	(617.)	(61.)	(530.37)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1478.	630.	187.	65.	18743.
CMS	42.	18.	5.	2.	531.
INCHES		20.21	24.00	25.05	25.05
MM		513.22	609.55	636.27	636.28
AC-FT		312.	371.	387.	387.
THOUS CU M		385.	458.	478.	478.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	148.	63.	19.	7.	1874.
CMS	4.	2.	1.	0.	53.
INCHES		2.02	2.40	2.50	2.51
MM		51.32	60.96	63.63	63.63
AC-FT		31.	37.	39.	39.
THOUS CU M		39.	46.	48.	48.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 2

Sh 20

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	296.	126.	37.	13.	3749.
CMS	8.	4.	1.	0.	106.
INCHES		4.04	4.80	5.01	5.01
MM		102.64	121.91	127.25	127.26
AC-FT		62.	74.	77.	77.
THOUS CU M		77.	92.	96.	96.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 3

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	443.	189.	56.	20.	5623.
CMS	13.	5.	2.	1.	159.
INCHES		6.06	7.20	7.51	7.52
MM		153.96	182.87	190.88	190.88
AC-FT		94.	111.	116.	116.
THOUS CU M		116.	137.	143.	143.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 4

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	591.	252.	75.	26.	7497.
CMS	17.	7.	2.	1.	212.
INCHES		8.08	9.60	10.02	10.02
MM		205.29	243.82	254.51	254.51
AC-FT		125.	148.	155.	155.
THOUS CU M		154.	183.	191.	191.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 5

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	739.	315.	94.	33.	9371.
CMS	21.	9.	3.	1.	265.
INCHES		10.10	12.00	12.52	12.53
MM		256.61	304.78	318.13	318.14
AC-FT		156.	185.	194.	194.
THOUS CU M		193.	229.	239.	239.

•••••••••• •••••••••• •••••••••• •••••••••• ••••••••••

HYDROGRAPH ROUTING

ROUTING THROUGH UPPER RESERVOIR

	ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
OUTFLO	1		0	0	0	0	1	0	0

ROUTING DATA

	OLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
	0.0	0.000	0.00	1	1	0	0	0

	NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPHAT
	1	0	0	0.000	0.000	0.000	-121.	-1

Sh 21

STAGE	121.00	121.20	121.30	121.50	121.70	123.00	127.00	133.00
FLOW	0.00	10.00	20.00	34.00	38.50	42.00	55.00	69.50
SURFACE AREA=	0.	18.	32.					

CAPACITY= 0. 21. 305.

ELEVATION= 118. 122. 133.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
133.0	3.0	1.5	700.

STATION OUTFLO, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

5.	4.	4.	4.	4.	3.	3.	3.	3.	2.
2.	2.	2.	2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	2.	2.	2.	2.	3.
3.	3.	3.	3.	3.	3.	3.	4.	4.	4.
4.	4.	4.	4.	4.	5.	6.	7.	9.	11.
14.	18.	21.	23.	25.	28.	30.	32.	35.	36.
39.	39.	39.	39.	39.	39.	39.	40.	40.	40.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	38.	37.	36.	35.	35.	33.	31.	29.	27.
25.	23.	21.	19.	17.	15.	13.	12.	11.	10.
9.	9.	8.	8.	7.	7.	6.	6.	6.	5.
5.	5.	4.	4.	4.	4.	3.	3.	3.	3.
3.	2.	2.	2.	2.	2.	2.	2.	2.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STORAGE

14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.

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14.	14.	14.	14.	14.	14.	15.	15.	16.	16.
17.	17.	18.	18.	19.	19.	20.	21.	21.	23.
25.	27.	29.	30.	30.	31.	31.	32.	32.	32.
31.	31.	30.	30.	29.	28.	26.	27.	26.	26.
25.	24.	23.	23.	22.	21.	21.	20.	20.	19.
19.	18.	18.	17.	17.	17.	17.	16.	16.	16.
16.	16.	15.	15.	15.	15.	15.	15.	15.	15.
15.	15.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.

STAGE

121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.2	121.2
121.2	121.3	121.3	121.3	121.4	121.4	121.4	121.5	121.5	121.6
121.7	121.8	121.9	122.0	122.0	122.0	122.1	122.1	122.1	122.1
122.1	122.0	122.0	122.0	121.9	121.9	121.9	121.8	121.8	121.8
121.7	121.7	121.6	121.6	121.6	121.5	121.5	121.5	121.4	121.4
121.4	121.3	121.3	121.3	121.3	121.3	121.2	121.2	121.2	121.2
121.2	121.2	121.2	121.2	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0

PEAK OUTFLOW IS 40. AT TIME 42.25 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	40.	39.	18.	7.	1939.
CMS	1.	1.	1.	0.	55.
INCHES		1.25	2.36	2.59	2.59
MM		31.69	59.91	65.80	65.81
AC-FT		19.	36.	40.	40.
THOUS CU M		24.	45.	49.	49.

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STATION OUTFLO, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

5.	4.	4.	4.	4.	3.	3.	3.	3.	2.
2.	2.	2.	2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	2.	3.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	3.
3.	3.	3.	3.	2.	2.	2.	2.	2.	2.
2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	3.	3.	4.	4.	4.	5.	5.
5.	6.	6.	6.	6.	7.	7.	7.	7.	7.
8.	8.	8.	8.	8.	9.	12.	17.	22.	26.
30.	34.	36.	37.	39.	39.	39.	39.	40.	40.
41.	41.	42.	42.	43.	43.	43.	44.	44.	44.
44.	44.	44.	44.	44.	43.	43.	43.	43.	43.
43.	43.	43.	43.	42.	42.	42.	42.	42.	42.
42.	42.	41.	41.	41.	41.	41.	41.	41.	41.
41.	41.	40.	40.	40.	40.	40.	40.	40.	40.
39.	39.	39.	39.	39.	39.	39.	39.	39.	38.
37.	36.	35.	34.	33.	30.	28.	26.	24.	22.
20.	17.	15.	13.	12.	10.	9.	8.	8.	8.
7.	7.	6.	6.	6.	5.	5.	4.	4.	4.
4.	3.	3.	3.	3.	3.	2.	2.	2.	2.
2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STORAGE

14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	15.	15.
15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	16.	16.	16.	17.	18.	19.
20.	21.	22.	24.	25.	26.	28.	29.	32.	35.
40.	45.	49.	52.	54.	56.	57.	58.	59.	60.
60.	60.	60.	59.	59.	58.	57.	57.	56.	55.
55.	54.	53.	52.	52.	51.	50.	49.	49.	48.
47.	46.	46.	45.	44.	43.	42.	42.	41.	40.
39.	39.	38.	37.	36.	35.	35.	34.	33.	32.
31.	31.	30.	29.	28.	27.	27.	26.	25.	24.
24.	23.	22.	21.	21.	20.	19.	19.	18.	18.
18.	17.	17.	17.	16.	16.	16.	16.	16.	15.
15.	15.	15.	15.	15.	15.	15.	14.	14.	14.

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14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.

STAGE

121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.2	121.2	121.2	121.2	121.2	121.2	121.2	121.3	121.3	121.4
121.4	121.5	121.6	121.6	121.7	121.8	121.9	122.0	122.1	122.3
122.5	122.8	123.0	123.1	123.2	123.3	123.4	123.5	123.5	123.5
123.6	123.6	123.5	123.5	123.5	123.4	123.4	123.4	123.3	123.3
123.3	123.2	123.2	123.2	123.1	123.1	123.0	123.0	123.0	122.9
122.9	122.9	122.8	122.8	122.7	122.7	122.7	122.6	122.6	122.5
122.5	122.4	122.4	122.4	122.3	122.3	122.2	122.2	122.2	122.1
122.1	122.0	122.0	121.9	121.9	121.9	121.8	121.8	121.7	121.7
121.6	121.6	121.6	121.5	121.5	121.4	121.4	121.4	121.4	121.3
121.3	121.3	121.3	121.2	121.2	121.2	121.2	121.2	121.2	121.2
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0

PEAK OUTFLOW IS 44. AT TIME 42.75 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	44.	43.	35.	13.	3812.
CMS	1.	1.	1.	0.	108.
INCHES		1.38	4.52	5.09	5.10
MM		35.13	114.78	129.36	129.42
AC-FT		21.	70.	79.	79.
THOUS CU M		26.	86.	97.	97.

STATION OUTFLO, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

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OUTFLOW

5.	4.	4.	4.	4.	3.	3.	3.	3.	2.
2.	2.	2.	2.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	0.	1.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

0.	0.	0.	1.	2.	3.	5.	5.	6.	6.
6.	7.	7.	7.	6.	6.	6.	6.	5.	5.
5.	4.	4.	4.	4.	3.	3.	3.	3.	3.
3.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	4.	4.	5.	5.	6.	6.	7.	7.
8.	8.	9.	9.	10.	10.	10.	11.	12.	12.
12.	13.	13.	13.	14.	16.	21.	25.	31.	35.
37.	39.	39.	39.	40.	40.	40.	41.	41.	42.
43.	45.	46.	46.	47.	47.	48.	48.	48.	48.
49.	49.	49.	48.	48.	48.	48.	48.	48.	48.
48.	48.	48.	47.	47.	47.	47.	47.	47.	47.
47.	46.	46.	46.	46.	46.	46.	46.	46.	45.
45.	45.	45.	45.	45.	45.	44.	44.	44.	44.
44.	44.	44.	43.	43.	43.	43.	43.	43.	43.
42.	42.	42.	42.	42.	42.	42.	42.	41.	41.
41.	41.	41.	41.	41.	41.	41.	40.	40.	40.
40.	40.	40.	40.	40.	39.	39.	39.	39.	39.
39.	39.	39.	39.	38.	37.	36.	35.	34.	32.
29.	27.	25.	23.	21.	18.	16.	14.	12.	11.
10.	9.	9.	8.	7.	7.	6.	6.	6.	6.
5.	5.	4.	4.	4.	3.	3.	3.	3.	3.
2.	2.	2.	2.	2.	2.	2.	1.	1.	1.

STORAGE

14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	14.	14.	14.	15.	15.	15.
15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	15.	15.	15.	15.	15.
15.	16.	16.	16.	16.	16.	16.	16.	16.	16.
16.	16.	16.	17.	17.	17.	18.	19.	20.	22.
24.	25.	27.	29.	32.	34.	37.	40.	44.	50.
57.	65.	71.	76.	79.	82.	85.	87.	89.	90.
91.	91.	91.	90.	90.	89.	88.	88.	87.	86.
86.	85.	84.	84.	83.	82.	81.	80.	80.	79.
78.	77.	76.	75.	75.	74.	73.	72.	71.	70.
70.	69.	68.	67.	66.	65.	64.	63.	63.	62.
61.	60.	59.	58.	57.	57.	56.	55.	54.	53.
52.	51.	50.	50.	49.	48.	47.	46.	45.	45.
44.	43.	42.	41.	40.	40.	39.	38.	37.	36.
35.	35.	34.	33.	32.	31.	30.	30.	29.	28.
27.	26.	26.	25.	24.	23.	23.	22.	21.	20.
20.	19.	19.	18.	18.	17.	17.	17.	16.	16.
16.	16.	16.	15.	15.	15.	15.	15.	15.	15.
15.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.

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STAGE

121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0

121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.2	121.2	121.2	121.2	121.2	121.2	121.2	121.2	121.2	121.2
121.2	121.2	121.2	121.2	121.2	121.3	121.3	121.4	121.5	121.5
121.6	121.7	121.8	122.0	122.1	122.2	122.4	122.5	122.7	123.0
123.4	123.6	124.1	124.3	124.5	124.6	124.7	124.8	124.9	125.0
125.0	125.0	125.0	125.0	125.0	124.9	124.9	124.9	124.8	124.8
124.8	124.7	124.7	124.7	124.6	124.6	124.6	124.5	124.5	124.4
124.4	124.4	124.3	124.3	124.3	124.2	124.2	124.1	124.1	124.0
124.0	124.0	123.9	123.9	123.8	123.8	123.8	123.7	123.7	123.6
123.6	123.5	123.5	123.5	123.4	123.4	123.3	123.3	123.2	123.2
123.2	123.1	123.1	123.0	123.0	122.9	122.9	122.8	122.8	122.8
122.7	122.7	122.6	122.6	122.5	122.5	122.5	122.4	122.4	122.3
122.3	122.2	122.2	122.1	122.1	122.1	122.0	122.0	121.9	121.9
121.8	121.8	121.8	121.7	121.7	121.6	121.6	121.5	121.5	121.5
121.4	121.4	121.4	121.3	121.3	121.3	121.3	121.2	121.2	121.2
121.2	121.2	121.2	121.2	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0

PEAK OUTFLOW IS 49. AT TIME 43.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	49.	48.	44.	20.	5672.
CMS	1.	1.	1.	1.	161.
INCHES		1.53	5.65	7.55	7.58
MM		38.98	143.47	191.85	192.56
AC-FT		24.	87.	117.	117.
THOUS CU M		29.	108.	144.	145.

STATION OUTFLO, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

5.	4.	4.	4.	4.	3.	3.	3.	3.	2.
2.	2.	2.	2.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	3.	5.	6.	7.	8.	8.
8.	9.	9.	9.	9.	8.	8.	7.	7.	7.
6.	6.	6.	5.	5.	5.	4.	4.	4.	4.
3.	3.	3.	3.	3.	3.	2.	2.	2.	2.
2.	3.	3.	3.	3.	3.	3.	3.	3.	3.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	5.	5.	6.	7.	8.	9.	9.	10.
11.	12.	13.	14.	15.	15.	16.	16.	17.	17.
17.	18.	18.	18.	19.	21.	26.	32.	36.	39.
39.	39.	40.	40.	41.	41.	42.	42.	43.	44.
46.	48.	49.	50.	51.	51.	52.	52.	53.	53.

34 37

53.	53.	53.	53.	53.	53.	53.	53.	53.	52.
52.	52.	52.	52.	52.	52.	52.	52.	51.	51.
51.	51.	51.	51.	51.	51.	50.	50.	50.	50.
50.	50.	50.	50.	49.	49.	49.	49.	49.	49.
49.	48.	48.	48.	48.	48.	48.	48.	47.	47.
47.	47.	47.	47.	47.	46.	46.	46.	46.	46.
46.	46.	45.	45.	45.	45.	45.	45.	44.	44.
44.	44.	44.	44.	44.	43.	43.	43.	43.	43.
43.	43.	42.	42.	42.	42.	42.	42.	42.	42.
41.	41.	41.	41.	41.	41.	41.	41.	40.	40.
40.	40.	40.	40.	40.	40.	40.	39.	39.	39.
39.	39.	39.	39.	39.	38.	37.	36.	36.	35.
33.	31.	28.	26.	24.	22.	20.	17.	15.	13.

STORAGE

14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	14.	14.	15.	15.	15.	15.	15.
16.	16.	16.	16.	16.	16.	15.	15.	15.	15.
15.	15.	15.	15.	15.	15.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	15.	15.	15.	15.	15.	16.	16.	16.
16.	16.	17.	17.	17.	17.	17.	17.	17.	17.
17.	17.	17.	17.	17.	18.	19.	20.	22.	25.
27.	30.	33.	36.	39.	43.	47.	51.	56.	64.
75.	85.	94.	100.	105.	109.	113.	116.	119.	121.
122.	122.	122.	122.	121.	121.	120.	119.	119.	118.
117.	117.	116.	115.	114.	113.	113.	112.	111.	110.
109.	108.	107.	107.	106.	105.	104.	103.	102.	101.
100.	99.	98.	97.	96.	96.	95.	94.	93.	92.
91.	90.	89.	88.	87.	86.	85.	84.	83.	82.
81.	80.	79.	78.	77.	77.	76.	75.	74.	73.
72.	71.	70.	69.	68.	67.	66.	65.	64.	64.
63.	62.	61.	60.	59.	58.	57.	56.	56.	55.
54.	53.	52.	51.	50.	49.	49.	48.	47.	46.
45.	44.	43.	43.	42.	41.	40.	39.	38.	38.
37.	36.	35.	34.	33.	33.	32.	31.	30.	29.
28.	28.	27.	26.	25.	24.	24.	23.	22.	21.
21.	20.	20.	19.	18.	18.	18.	17.	17.	17.

STAGE

121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.1	121.1	121.1	121.1	121.2	121.2
121.2	121.2	121.2	121.2	121.2	121.2	121.2	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.0	121.0	121.0	121.0
121.0	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.2	121.2	121.2	121.2
121.2	121.2	121.2	121.2	121.2	121.3	121.3	121.3	121.3	121.3
121.3	121.3	121.3	121.3	121.3	121.3	121.4	121.5	121.6	121.7

Sh 28

121.8	122.0	122.1	122.3	122.5	122.7	122.9	123.1	123.3	123.7
124.3	124.8	125.1	125.4	125.6	125.8	126.0	126.1	126.2	126.3
126.4	126.4	126.4	126.4	126.4	126.3	126.3	126.3	126.2	126.2
126.2	126.2	126.1	126.1	126.1	126.0	126.0	125.9	125.9	125.9
125.8	125.8	125.8	125.7	125.7	125.6	125.6	125.6	125.5	125.5
125.4	125.4	125.4	125.3	125.3	125.2	125.2	125.1	125.1	125.1
125.0	125.0	124.9	124.9	124.8	124.8	124.7	124.7	124.7	124.6
124.6	124.5	124.5	124.4	124.4	124.3	124.3	124.3	124.2	124.2
124.1	124.1	124.0	124.0	123.9	123.9	123.9	123.8	123.8	123.7
123.7	123.6	123.6	123.5	123.5	123.5	123.4	123.4	123.3	123.3
123.2	123.2	123.1	123.1	123.1	123.0	123.0	122.9	122.9	122.8
122.8	122.7	122.7	122.7	122.6	122.6	122.5	122.5	122.4	122.4
122.3	122.3	122.3	122.2	122.2	122.1	122.1	122.0	122.0	122.0
121.9	121.9	121.8	121.8	121.7	121.7	121.6	121.6	121.6	121.5
121.5	121.5	121.4	121.4	121.4	121.3	121.3	121.3	121.3	121.2

PEAK OUTFLOW IS 53. AT TIME 43.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	53.	52.	48.	20.	7400.
CMS	2.	1.	1.	1.	210.
INCHES		1.68	6.20	9.84	9.89
MM		42.63	157.38	249.98	251.20
AC-FT		20.	9[illegible].	152.	153.
THOUS CU M		32.	[illegible].	188.	189.

STATION OUTFLO, PLAN 1, RATIO 5

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

5.	4.	4.	4.	4.	3.	3.	3.	3.	3.
2.	2.	2.	2.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	4.	6.	8.	9.	10.	10.
11.	11.	12.	11.	11.	10.	10.	9.	9.	8.
8.	7.	7.	6.	6.	6.	5.	5.	5.	5.
4.	4.	4.	4.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	4.	4.	4.	4.	4.	4.
4.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	6.	7.	8.	9.	10.	11.	13.	14.
15.	17.	18.	18.	19.	20.	20.	21.	21.	21.
22.	22.	22.	22.	23.	25.	31.	38.	39.	39.
39.	40.	40.	41.	42.	42.	43.	44.	45.	47.
49.	51.	52.	53.	54.	55.	55.	56.	56.	56.
57.	57.	57.	57.	57.	57.	57.	56.	56.	56.
56.	56.	56.	56.	56.	56.	56.	56.	56.	56.
55.	55.	55.	55.	55.	55.	55.	55.	55.	54.
54.	54.	54.	54.	54.	54.	53.	53.	53.	53.
53.	53.	53.	52.	52.	52.	52.	52.	52.	52.
51.	51.	51.	51.	51.	51.	51.	50.	50.	50.
50.	50.	50.	50.	49.	49.	49.	49.	49.	49.
49.	48.	48.	48.	48.	48.	48.	47.	47.	47.
47.	47.	47.	47.	46.	46.	46.	46.	46.	46.
46.	45.	45.	45.	45.	45.	45.	45.	44.	44.
44.	44.	44.	44.	44.	43.	43.	43.	43.	43.

43.	43.	42.	42.	42.	42.	42.	42.	42.	41.
41.	41.	41.	41.	41.	41.	41.	41.	40.	40.

STORAGE

14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	13.	13.	13.	13.	13.	13.	13.
13.	13.	13.	14.	14.	15.	15.	16.	16.	16.
16.	16.	16.	16.	16.	16.	16.	16.	16.	15.
15.	15.	15.	15.	15.	15.	15.	15.	15.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	15.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	15.	16.	16.	16.	16.	17.
17.	17.	17.	17.	17.	18.	18.	18.	18.	18.
18.	18.	18.	18.	18.	19.	20.	22.	25.	28.
31.	35.	38.	42.	47.	51.	56.	62.	68.	79.
92.	106.	116.	124.	131.	136.	141.	145.	149.	151.
153.	154.	154.	154.	153.	153.	152.	151.	151.	150.
149.	149.	148.	147.	146.	146.	145.	144.	143.	142.
141.	140.	139.	138.	137.	136.	136.	135.	134.	133.
132.	131.	130.	129.	128.	127.	126.	124.	123.	122.
121.	120.	119.	118.	117.	116.	115.	114.	113.	112.
111.	110.	109.	108.	107.	106.	105.	104.	103.	102.
101.	100.	99.	98.	97.	96.	95.	94.	93.	92.
91.	90.	89.	88.	87.	86.	85.	84.	83.	82.
61.	80.	79.	78.	77.	76.	75.	74.	73.	72.
71.	70.	70.	69.	68.	67.	66.	65.	64.	63.
62.	61.	60.	59.	59.	58.	57.	56.	55.	54.
53.	52.	51.	51.	50.	49.	48.	47.	46.	45.
45.	44.	43.	42.	41.	40.	39.	39.	38.	37.

STAGE

121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0	121.0
121.0	121.0	121.0	121.0	121.1	121.1	121.2	121.2	121.2	121.2
121.2	121.2	121.2	121.2	121.2	121.2	121.2	121.2	121.2	121.2
121.2	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1	121.1
121.1	121.1	121.1	121.1	121.2	121.2	121.2	121.2	121.2	121.2
121.3	121.3	121.3	121.3	121.3	121.3	121.3	121.3	121.3	121.3
121.3	121.3	121.3	121.3	121.3	121.4	121.5	121.6	121.7	121.9
122.0	122.2	122.4	122.6	122.9	123.1	123.4	123.6	124.0	124.5
125.1	125.7	126.1	126.5	126.8	127.0	127.2	127.3	127.5	127.6
127.7	127.7	127.7	127.7	127.7	127.6	127.6	127.6	127.6	127.6
127.5	127.5	127.5	127.4	127.4	127.4	127.3	127.3	127.3	127.2
127.2	127.1	127.1	127.1	127.0	127.0	127.0	126.9	126.9	126.8
126.8	126.7	126.7	126.7	126.6	126.6	126.5	126.5	126.4	126.4
126.4	126.3	126.3	126.2	126.2	126.1	126.1	126.1	126.0	126.0
125.9	125.9	125.8	125.8	125.7	125.7	125.6	125.6	125.6	125.5
125.5	125.4	125.4	125.3	125.3	125.2	125.2	125.1	125.1	125.1
125.0	125.0	124.9	124.9	124.8	124.8	124.7	124.7	124.6	124.6
124.6	124.5	124.5	124.4	124.4	124.3	124.3	124.2	124.2	124.1

Sh 30

124.1	124.1	124.0	124.0	123.9	123.9	123.8	123.8	123.7	123.7
123.7	123.6	123.6	123.5	123.5	123.4	123.4	123.3	123.3	123.2
123.2	123.2	123.1	123.1	123.0	123.0	122.9	122.9	122.9	122.8
122.8	122.7	122.7	122.6	122.6	122.5	122.5	122.5	122.4	122.4

PEAK OUTFLOW IS 57. AT TIME 43.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	57.	56.	52.	29.	8285.
CMS	2.	2.	1.	1.	235.
INCHES		1.80	6.73	11.03	11.07
MM		45.78	170.86	280.04	281.26
AC-FT		28.	104.	170.	171.
THOUS CU M		34.	128.	210.	211.

•••••••••• •••••••••• •••••••••• •••••••••• ••••••••••

SUB-AREA RUNOFF COMPUTATION

RUNOFF TO LOWER RESERVOIR

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
INFLOW		0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	.11	0.00	.40	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	23.50	113.00	123.00	132.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TC= 0.00 LAG= .50

RECESSION DATA

STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00

UNIT HYDROGRAPH 12 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= .50 VOL= 1.00

27. 80. 80. 48. 24. 13. 7. 3. 2. 1.
1. 0.

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.15	1	.00	0.00	.00	0.	1.02	13.45	151	.64	.62	.01	164.
1.01	.30	2	.00	0.00	.00	0.	1.02	14.00	152	.64	.62	.01	170.
1.01	.45	3	.00	0.00	.00	0.	1.02	14.15	153	.80	.78	.01	178.
1.01	1.00	4	.00	0.00	.00	0.	1.02	14.30	154	.80	.78	.01	192.
1.01	1.15	5	.00	0.00	.00	0.	1.02	14.45	155	.80	.78	.01	206.
1.01	1.30	6	.00	0.00	.00	0.	1.02	15.00	156	.80	.78	.01	214.
1.01	1.45	7	.00	0.00	.00	0.	1.02	15.15	157	.81	.79	.01	218.

Sk 31

1.01	2.00	8	.00	0.00	.00	0.	1.02	15.30	158	1.61	1.60	.01	243.
1.01	2.15	9	.00	0.00	.00	0.	1.02	15.45	159	4.52	4.51	.01	386.
1.01	2.30	10	.00	0.00	.00	0.	1.02	16.00	160	1.13	1.12	.01	593.
1.01	2.45	11	.00	0.00	.00	0.	1.02	16.15	161	.74	.73	.01	583.
1.01	3.00	12	.00	0.00	.00	0.	1.02	16.30	162	.74	.73	.01	442.
1.01	3.15	13	.00	0.00	.00	0.	1.02	16.45	163	.74	.73	.01	328.
1.01	3.30	14	.00	0.00	.00	0.	1.02	17.00	164	.74	.73	.01	270.
1.01	3.45	15	.00	0.00	.00	0.	1.02	17.15	165	.58	.57	.01	236.
1.01	4.00	16	.00	0.00	.00	0.	1.02	17.30	166	.58	.57	.01	208.
1.01	4.15	17	.00	0.00	.00	0.	1.02	17.45	167	.58	.57	.01	187.
1.01	4.30	18	.00	0.00	.00	0.	1.02	18.00	168	.58	.57	.01	175.
1.01	4.45	19	.00	0.00	.00	0.	1.02	18.15	169	.04	.03	.01	155.
1.01	5.00	20	.00	0.00	.00	0.	1.02	18.30	170	.04	.03	.01	108.
1.01	5.15	21	.00	0.00	.00	0.	1.02	18.45	171	.04	.03	.01	63.
1.01	5.30	22	.00	0.00	.00	0.	1.02	19.00	172	.04	.03	.01	36.
1.01	5.45	23	.00	0.00	.00	0.	1.02	19.15	173	.04	.03	.01	29.
1.01	6.00	24	.00	0.00	.00	0.	1.02	19.30	174	.04	.03	.01	27.
1.01	6.15	25	.01	0.00	.01	0.	1.02	19.45	175	.04	.03	.01	25.
1.01	6.30	26	.01	0.00	.01	0.	1.02	20.00	176	.04	.03	.01	23.
1.01	6.45	27	.01	0.00	.01	0.	1.02	20.15	177	.04	.03	.01	22.
1.01	7.00	28	.01	0.00	.01	0.	1.02	20.30	178	.04	.03	.01	20.
1.01	7.15	29	.01	0.00	.01	0.	1.02	20.45	179	.04	.03	.01	19.
1.01	7.30	30	.01	0.00	.01	0.	1.02	21.00	180	.04	.03	.01	18.
1.01	7.45	31	.01	0.00	.01	0.	1.02	21.15	181	.04	.03	.01	16.
1.01	8.00	32	.01	0.00	.01	0.	1.02	21.30	182	.04	.03	.01	15.
1.01	8.15	33	.01	0.00	.01	0.	1.02	21.45	183	.04	.03	.01	14.
1.01	8.30	34	.01	0.00	.01	0.	1.02	22.00	184	.04	.03	.01	13.
1.01	8.45	35	.01	0.00	.01	0.	1.02	22.15	185	.04	.03	.01	12.
1.01	9.00	36	.01	0.00	.01	0.	1.02	22.30	186	.04	.03	.01	12.
1.01	9.15	37	.01	0.00	.01	0.	1.02	22.45	187	.04	.03	.01	11.
1.01	9.30	38	.01	0.00	.01	0.	1.02	23.00	188	.04	.03	.01	10.
1.01	9.45	39	.01	0.00	.01	0.	1.02	23.15	189	.04	.03	.01	9.
1.01	10.00	40	.01	0.00	.01	0.	1.02	23.30	190	.04	.03	.01	9.
1.01	10.15	41	.01	0.00	.01	0.	1.02	23.45	191	.04	.03	.01	8.
1.01	10.30	42	.01	0.00	.01	0.	1.03	0.00	192	.04	.03	.01	8.
1.01	10.45	43	.01	0.00	.01	0.	1.03	.15	193	0.00	0.00	0.00	8.
1.01	11.00	44	.01	0.00	.01	0.	1.03	.30	194	0.00	0.00	0.00	7.
1.01	11.15	45	.01	0.00	.01	0.	1.03	.45	195	0.00	0.00	0.00	7.
1.01	11.30	46	.01	0.00	.01	0.	1.03	1.00	196	0.00	0.00	0.00	6.
1.01	11.45	47	.01	0.00	.01	0.	1.03	1.15	197	0.00	0.00	0.00	6.
1.01	12.00	48	.01	0.00	.01	0.	1.03	1.30	198	0.00	0.00	0.00	6.
1.01	12.15	49	.04	0.00	.04	0.	1.03	1.45	199	0.00	0.00	0.00	5.
1.01	12.30	50	.04	0.00	.04	0.	1.03	2.00	200	0.00	0.00	0.00	5.
1.01	12.45	51	.04	0.00	.04	0.	1.03	2.15	201	0.00	0.00	0.00	5.
1.01	13.00	52	.04	0.00	.04	0.	1.03	2.30	202	0.00	0.00	0.00	4.
1.01	13.15	53	.05	0.00	.05	0.	1.03	2.45	203	0.00	0.00	0.00	4.
1.01	13.30	54	.05	0.00	.05	0.	1.03	3.00	204	0.00	0.00	0.00	4.
1.01	13.45	55	.05	0.00	.05	0.	1.03	3.15	205	0.00	0.00	0.00	3.
1.01	14.00	56	.05	0.00	.05	0.	1.03	3.30	206	0.00	0.00	0.00	3.
1.01	14.15	57	.06	0.00	.06	0.	1.03	3.45	207	0.00	0.00	0.00	3.
1.01	14.30	58	.06	0.00	.06	0.	1.03	4.00	208	0.00	0.00	0.00	3.
1.01	14.45	59	.06	0.00	.06	0.	1.03	4.15	209	0.00	0.00	0.00	3.
1.01	15.00	60	.06	0.00	.06	0.	1.03	4.30	210	0.00	0.00	0.00	2.
1.01	15.15	61	.06	0.00	.06	0.	1.03	4.45	211	0.00	0.00	0.00	2.
1.01	15.30	62	.12	0.00	.12	0.	1.03	5.00	212	0.00	0.00	0.00	2.
1.01	15.45	63	.34	.30	.04	8.	1.03	5.15	213	0.00	0.00	0.00	2.
1.01	16.00	64	.09	.07	.01	26.	1.03	5.30	214	0.00	0.00	0.00	2.
1.01	16.15	65	.06	.04	.01	31.	1.03	5.45	215	0.00	0.00	0.00	2.
1.01	16.30	66	.06	.04	.01	25.	1.03	6.00	216	0.00	0.00	0.00	2.
1.01	16.45	67	.06	.04	.01	19.	1.03	6.15	217	0.00	0.00	0.00	1.
1.01	17.00	68	.06	.04	.01	16.	1.03	6.30	218	0.00	0.00	0.00	1.
1.01	17.15	69	.04	.03	.01	14.	1.03	6.45	219	0.00	0.00	0.00	1.

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1.01	17.30	70	.04	.03	.01	12.	1.03	7.00	220	0.00	0.00	0.00	1.
1.01	17.45	71	.04	.03	.01	11.	1.03	7.15	221	0.00	0.00	0.00	1.
1.01	18.00	72	.04	.03	.01	10.	1.03	7.30	222	0.00	0.00	0.00	1.
1.01	18.15	73	.00	0.00	.00	9.	1.03	7.45	223	0.00	0.00	0.00	1.
1.01	18.30	74	.00	0.00	.00	6.	1.03	8.00	224	0.00	0.00	0.00	1.
1.01	18.45	75	.00	0.00	.00	3.	1.03	8.15	225	0.00	0.00	0.00	1.
1.01	19.00	76	.00	0.00	.00	2.	1.03	8.30	226	0.00	0.00	0.00	1.
1.01	19.15	77	.00	0.00	.00	1.	1.03	8.45	227	0.00	0.00	0.00	1.
1.01	19.30	78	.00	0.00	.00	1.	1.03	9.00	228	0.00	0.00	0.00	1.
1.01	19.45	79	.00	0.00	.00	1.	1.03	9.15	229	0.00	0.00	0.00	1.
1.01	20.00	80	.00	0.00	.00	1.	1.03	9.30	230	0.00	0.00	0.00	1.
1.01	20.15	81	.00	0.00	.00	1.	1.03	9.45	231	0.00	0.00	0.00	1.
1.01	20.30	82	.00	0.00	.00	1.	1.03	10.00	232	0.00	0.00	0.00	1.
1.01	20.45	83	.00	0.00	.00	1.	1.03	10.15	233	0.00	0.00	0.00	0.
1.01	21.00	84	.00	0.00	.00	1.	1.03	10.30	234	0.00	0.00	0.00	0.
1.01	21.15	85	.00	0.00	.00	1.	1.03	10.45	235	0.00	0.00	0.00	0.
1.01	21.30	86	.00	0.00	.00	1.	1.03	11.00	236	0.00	0.00	0.00	0.
1.01	21.45	87	.00	0.00	.00	1.	1.03	11.15	237	0.00	0.00	0.00	0.
1.01	22.00	88	.00	0.00	.00	1.	1.03	11.30	238	0.00	0.00	0.00	0.
1.01	22.15	89	.00	0.00	.00	1.	1.03	11.45	239	0.00	0.00	0.00	0.
1.01	22.30	90	.00	0.00	.00	1.	1.03	12.00	240	0.00	0.00	0.00	0.
1.01	22.45	91	.00	0.00	.00	1.	1.03	12.15	241	0.00	0.00	0.00	0.
1.01	23.00	92	.00	0.00	.00	1.	1.03	12.30	242	0.00	0.00	0.00	0.
1.01	23.15	93	.00	0.00	.00	0.	1.03	12.45	243	0.00	0.00	0.00	0.
1.01	23.30	94	.00	0.00	.00	0.	1.03	13.00	244	0.00	0.00	0.00	0.
1.01	23.45	95	.00	0.00	.00	0.	1.03	13.15	245	0.00	0.00	0.00	0.
1.02	0.00	96	.00	0.00	.00	0.	1.03	13.30	246	0.00	0.00	0.00	0.
1.02	.15	97	.03	.02	.01	0.	1.03	13.45	247	0.00	0.00	0.00	0.
1.02	.30	98	.03	.02	.01	2.	1.03	14.00	248	0.00	0.00	0.00	0.
1.02	.45	99	.03	.02	.01	3.	1.03	14.15	249	0.00	0.00	0.00	0.
1.02	1.00	100	.03	.02	.01	4.	1.03	14.30	250	0.00	0.00	0.00	0.
1.02	1.15	101	.03	.02	.01	4.	1.03	14.45	251	0.00	0.00	0.00	0.
1.02	1.30	102	.03	.02	.01	4.	1.03	15.00	252	0.00	0.00	0.00	0.
1.02	1.45	103	.03	.02	.01	4.	1.03	15.15	253	0.00	0.00	0.00	0.
1.02	2.00	104	.03	.02	.01	4.	1.03	15.30	254	0.00	0.00	0.00	0.
1.02	2.15	105	.03	.02	.01	4.	1.03	15.45	255	0.00	0.00	0.00	0.
1.02	2.30	106	.03	.02	.01	4.	1.03	16.00	256	0.00	0.00	0.00	0.
1.02	2.45	107	.03	.02	.01	4.	1.03	16.15	257	0.00	0.00	0.00	0.
1.02	3.00	108	.03	.02	.01	4.	1.03	16.30	258	0.00	0.00	0.00	0.
1.02	3.15	109	.03	.02	.01	4.	1.03	16.45	259	0.00	0.00	0.00	0.
1.02	3.30	110	.03	.02	.01	4.	1.03	17.00	260	0.00	0.00	0.00	0.
1.02	3.45	111	.03	.02	.01	4.	1.03	17.15	261	0.00	0.00	0.00	0.
1.02	4.00	112	.03	.02	.01	4.	1.03	17.30	262	0.00	0.00	0.00	0.
1.02	4.15	113	.03	.02	.01	4.	1.03	17.45	263	0.00	0.00	0.00	0.
1.02	4.30	114	.03	.02	.01	4.	1.03	18.00	264	0.00	0.00	0.00	0.
1.02	4.45	115	.03	.02	.01	4.	1.03	18.15	265	0.00	0.00	0.00	0.
1.02	5.00	116	.03	.02	.01	4.	1.03	18.30	266	0.00	0.00	0.00	0.
1.02	5.15	117	.03	.02	.01	4.	1.03	18.45	267	0.00	0.00	0.00	0.
1.02	5.30	118	.03	.02	.01	4.	1.03	19.00	268	0.00	0.00	0.00	0.
1.02	5.45	119	.03	.02	.01	4.	1.03	19.15	269	0.00	0.00	0.00	0.
1.02	6.00	120	.03	.02	.01	4.	1.03	19.30	270	0.00	0.00	0.00	0.
1.02	6.15	121	.08	.07	.01	6.	1.03	19.45	271	0.00	0.00	0.00	0.
1.02	6.30	122	.08	.07	.01	10.	1.03	20.00	272	0.00	0.00	0.00	0.
1.02	6.45	123	.08	.07	.01	14.	1.03	20.15	273	0.00	0.00	0.00	0.
1.02	7.00	124	.08	.07	.01	16.	1.03	20.30	274	0.00	0.00	0.00	0.
1.02	7.15	125	.08	.07	.01	17.	1.03	20.45	275	0.00	0.00	0.00	0.
1.02	7.30	126	.08	.07	.01	18.	1.03	21.00	276	0.00	0.00	0.00	0.
1.02	7.45	127	.08	.07	.01	18.	1.03	21.15	277	0.00	0.00	0.00	0.
1.02	8.00	128	.08	.07	.01	19.	1.03	21.30	278	0.00	0.00	0.00	0.
1.02	8.15	129	.08	.07	.01	19.	1.03	21.45	279	0.00	0.00	0.00	0.
1.02	8.30	130	.08	.07	.01	19.	1.03	22.00	280	0.00	0.00	0.00	0.
1.02	8.45	131	.08	.07	.01	19.	1.03	22.15	281	0.00	0.00	0.00	0.

1.02	9.00	132	.08	.07	.01	19.	1.03	22.30	282	0.00	0.00	0.00	0.
1.02	9.15	133	.08	.07	.01	19.	1.03	22.45	283	0.00	0.00	0.00	0.
1.02	9.30	134	.08	.07	.01	19.	1.03	23.00	284	0.00	0.00	0.00	0.
1.02	9.45	135	.08	.07	.01	19.	1.03	23.15	285	0.00	0.00	0.00	0.
1.02	10.00	136	.08	.07	.01	19.	1.03	23.30	286	0.00	0.00	0.00	0.
1.02	10.15	137	.08	.07	.01	19.	1.03	23.45	287	0.00	0.00	0.00	0.
1.02	10.30	138	.08	.07	.01	19.	1.04	0.00	288	0.00	0.00	0.00	0.
1.02	10.45	139	.08	.07	.01	19.	1.04	.15	289	0.00	0.00	0.00	0.
1.02	11.00	140	.08	.07	.01	19.	1.04	.30	290	0.00	0.00	0.00	0.
1.02	11.15	141	.08	.07	.01	19.	1.04	.45	291	0.00	0.00	0.00	0.
1.02	11.30	142	.08	.07	.01	19.	1.04	1.00	292	0.00	0.00	0.00	0.
1.02	11.45	143	.08	.07	.01	19.	1.04	1.15	293	0.00	0.00	0.00	0.
1.02	12.00	144	.08	.07	.01	19.	1.04	1.30	294	0.00	0.00	0.00	0.
1.02	12.15	145	.53	.52	.01	31.	1.04	1.45	295	0.00	0.00	0.00	0.
1.02	12.30	146	.53	.52	.01	67.	1.04	2.00	296	0.00	0.00	0.00	0.
1.02	12.45	147	.53	.52	.01	103.	1.04	2.15	297	0.00	0.00	0.00	0.
1.02	13.00	148	.53	.52	.01	125.	1.04	2.30	298	0.00	0.00	0.00	0.
1.02	13.15	149	.64	.62	.01	138.	1.04	2.45	299	0.00	0.00	0.00	0.
1.02	13.30	150	.64	.62	.01	152.	1.04	3.00	300	0.00	0.00	0.00	0.
									SUM	26.70	24.30	2.40	7122.
										(678.)	(617.)	(61.)	(201.67)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	593.	240.	71.	25.	7134.
CMS	17.	7.	2.	1.	202.
INCHES		20.28	24.07	25.14	25.14
MM		515.12	611.42	638.53	638.53
AC-FT		119.	141.	147.	147.
THOUS CU M		147.	174.	182.	182.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	59.	24.	7.	2.	713.
CMS	2.	1.	0.	0.	20.
INCHES		2.03	2.41	2.51	2.51
MM		51.51	61.14	63.85	63.85
AC-FT		12.	14.	15.	15.
THOUS CU M		15.	17.	18.	18.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 2

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	119.	48.	14.	5.	1427.
CMS	3.	1.	0.	0.	40.
INCHES		4.06	4.81	5.03	5.03
MM		103.02	122.28	127.71	127.71
AC-FT		24.	28.	29.	29.
THOUS CU M		29.	35.	36.	36.

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HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 3

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	178.	72.	21.	7.	2140.
CMS	5.	2.	1.	0.	61.

INCHES		6.08	7.22	7.54	7.54
MM		154.54	183.43	191.56	191.56
AC-FT		36.	42.	44.	44.
THOUS CU M		44.	52.	55.	55.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 4

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	237.	96.	28.	10.	2854.
CMS	7.	3.	1.	0.	81.
INCHES		8.11	9.63	10.06	10.06
MM		206.05	244.57	255.41	255.41
AC-FT		48.	56.	59.	59.
THOUS CU M		59.	70.	73.	73.

HYDROGRAPH AT STAINFLOW FOR PLAN 1, RTIO 5

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	297.	120.	36.	12.	3567.
CMS	8.	3.	1.	0.	101.
INCHES		10.14	12.04	12.57	12.57
MM		257.56	305.71	319.26	319.27
AC-FT		59.	71.	74.	74.
THOUS CU M		73.	87.	91.	91.

COMBINE HYDROGRAPHS

COMBINING RUNOFF AND AND UPPER RESERVOIR OUTFLOW

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
COMBIN	2	0	0	0	0	1	0	0

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	97.	57.	25.	9.	2652.
CMS	3.	2.	1.	0.	75.
INCHES		1.33	2.36	2.57	2.57
MM		33.79	60.04	65.27	65.27
AC-FT		28.	50.	55.	55.
THOUS CU M		35.	62.	68.	68.

Sh 35

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 2

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	159.	86.	49.	18.	5239.
CMS	4.	2.	1.	1.	148.
INCHES		2.00	4.53	5.07	5.08

MM		50.80	115.05	128.90	128.95
AC-FT		43.	97.	108.	108.
THOUS CU M		53.	119.	133.	134.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 3

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	220.	113.	63.	27.	7813.
CMS	6.	3.	2.	1.	221.
INCHES		2.64	5.88	7.55	7.57
MM		67.01	149.34	191.77	192.28
AC-FT		56.	125.	161.	161.
THOUS CU M		69.	155.	199.	199.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 4

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	282.	140.	74.	35.	10253.
CMS	8.	4.	2.	1.	290.
INCHES		3.26	6.88	9.90	9.94
MM		82.76	174.75	251.47	252.36
AC-FT		69.	147.	211.	212.
THOUS CU M		86.	181.	260.	261.

SUM OF 2 HYDROGRAPHS AT COMBIN PLAN 1 RTIO 5

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	343.	167.	84.	41.	11852.
CMS	10.	5.	2.	1.	336.
INCHES		3.87	7.85	11.45	11.48
MM		98.37	199.34	290.81	291.71
AC-FT		83.	167.	244.	245.
THOUS CU M		102.	206.	301.	302.

HYDROGRAPH ROUTING

ROUTING THROUGH LOWER RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
OUTFLO	1	0	0	0	0	1	0	0

ROUTING DATA

ULOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-115.	0

Sh 36

SURFACE AREA=	0.	9.	18.
CAPACITY=	0.	18.	83.
ELEVATION=	109.	115.	120.

CREL	SPWID	COOW	EXPW	ELEVL	COOL	CAREA	EXPL
115.0	3.0	3.4	1.5	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COOD	EXPD	DAMWID
116.9	3.1	1.5	300.

STATION OUTFLO, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	3.	3.	3.	4.
4.	5.	6.	7.	8.	9.	10.	12.	13.	16.
18.	21.	23.	24.	26.	28.	40.	48.	52.	52.
50.	47.	45.	44.	43.	42.	42.	41.	41.	41.
41.	40.	40.	39.	38.	37.	37.	35.	34.	32.
30.	29.	27.	27.	26.	26.	26.	25.	25.	24.
24.	23.	23.	22.	22.	21.	21.	20.	20.	19.
19.	18.	18.	18.	17.	17.	16.	16.	16.	15.
15.	14.	14.	14.	13.	13.	13.	12.	12.	12.
11.	11.	11.	11.	10.	10.	10.	9.	9.	9.
9.	9.	8.	8.	8.	8.	7.	7.	7.	7.
7.	7.	6.	6.	6.	6.	6.	6.	6.	5.
5.	5.	5.	5.	5.	5.	5.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	2.	2.	2.	2.	2.	2.

STORAGE

18.	18.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	20.	20.
20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
20.	20.	20.	20.	20.	20.	20.	20.	20.	20.

20.	20.	20.	20.	20.	20.	20.	20.	20.	21.
21.	21.	21.	21.	21.	21.	21.	21.	21.	21.
21.	21.	21.	22.	22.	22.	22.	22.	23.	23.
24.	24.	25.	25.	26.	27.	28.	29.	30.	31.
33.	34.	36.	37.	37.	38.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	38.	38.	38.	38.
36.	38.	38.	38.	38.	38.	37.	37.	37.	37.
36.	36.	36.	35.	35.	35.	35.	34.	34.	34.
33.	33.	33.	33.	32.	32.	32.	32.	31.	31.
31.	31.	30.	30.	30.	30.	29.	29.	29.	29.
29.	28.	28.	28.	28.	28.	28.	27.	27.	27.
27.	27.	27.	26.	26.	26.	26.	26.	26.	25.
25.	25.	25.	25.	25.	25.	25.	25.	24.	24.
24.	24.	24.	24.	24.	24.	24.	24.	23.	23.
23.	23.	23.	23.	23.	23.	23.	23.	23.	23.
23.	22.	22.	22.	22.	22.	22.	22.	22.	22.
22.	22.	22.	22.	22.	22.	22.	22.	22.	21.

STAGE

115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1
115.1	115.1	115.1	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.3	115.3	115.3	115.3	115.3	115.3	115.3	115.3
115.3	115.3	115.3	115.3	115.3	115.3	115.3	115.3	115.3	115.3
115.3	115.3	115.3	115.3	115.3	115.3	115.4	115.4	115.4	115.4
115.4	115.4	115.4	115.4	115.4	115.4	115.5	115.5	115.5	115.6
115.6	115.7	115.7	115.8	115.9	116.0	116.0	116.1	116.2	116.4
116.5	116.6	116.7	116.8	116.9	116.9	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	116.9	116.9	116.9	116.9	116.9	116.9	116.9	116.8
116.8	116.8	116.8	116.7	116.7	116.7	116.7	116.6	116.6	116.6
116.6	116.5	116.5	116.5	116.5	116.4	116.4	116.4	116.4	116.3
116.3	116.3	116.3	116.3	116.2	116.2	116.2	116.2	116.2	116.1
116.1	116.1	116.1	116.1	116.0	116.0	116.0	116.0	116.0	116.0
115.9	115.9	115.9	115.9	115.9	115.9	115.9	115.8	115.8	115.8
115.8	115.8	115.8	115.8	115.7	115.7	115.7	115.7	115.7	115.7
115.7	115.7	115.7	115.7	115.6	115.6	115.6	115.6	115.6	115.6
115.6	115.6	115.6	115.6	115.6	115.5	115.5	115.5	115.5	115.5
115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5
115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4

PEAK OUTFLOW IS 52. AT TIME 42.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	52.	42.	23.	9.	2526.
CMS	1.	1.	1.	0.	72.
INCHES		.97	2.11	2.45	2.45
MM		24.64	53.50	62.12	62.18
AC-FT		21.	45.	52.	52.
THOUS CU M		26.	55.	64.	64.

Sh 38

STATION OUTFLO, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	3.	3.	3.
3.	3.	3.	3.	4.	4.	4.	4.	4.	4.
4.	5.	5.	5.	5.	6.	6.	7.	8.	9.
11.	12.	14.	16.	18.	20.	22.	25.	32.	90.
138.	142.	126.	110.	99.	92.	86.	82.	79.	74.
67.	60.	55.	52.	50.	49.	49.	48.	48.	47.
47.	46.	46.	46.	45.	45.	45.	45.	44.	44.
44.	44.	43.	43.	43.	43.	43.	42.	42.	42.
42.	42.	42.	41.	41.	41.	41.	41.	41.	40.
40.	40.	40.	40.	40.	40.	39.	39.	39.	39.
39.	38.	37.	36.	35.	34.	32.	31.	29.	28.
27.	26.	26.	26.	25.	25.	24.	24.	23.	23.
22.	22.	21.	21.	20.	20.	19.	19.	18.	18.
17.	17.	16.	16.	16.	15.	15.	14.	14.	14.
13.	13.	13.	12.	12.	12.	11.	11.	11.	10.
10.	10.	10.	9.	9.	9.	9.	8.	8.	8.
8.	8.	7.	7.	7.	7.	7.	6.	6.	6.
6.	6.	6.	6.	5.	5.	5.	5.	5.	5.

STORAGE

18.	18.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
20.	20.	20.	20.	21.	21.	20.	20.	20.	20.
21.	21.	21.	21.	21.	21.	21.	21.	21.	21.
21.	21.	21.	21.	21.	21.	21.	21.	21.	21.
21.	21.	21.	21.	21.	21.	21.	21.	21.	21.
21.	21.	21.	21.	21.	21.	21.	21.	21.	21.
21.	21.	21.	21.	22.	22.	22.	22.	22.	22.
22.	22.	22.	23.	23.	23.	23.	23.	23.	23.
24.	24.	24.	24.	24.	24.	25.	25.	26.	27.
28.	29.	31.	32.	33.	34.	35.	37.	38.	40.
41.	41.	41.	40.	40.	40.	40.	40.	40.	40.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	38.	38.	38.	38.	38.	38.	38.	38.

Sh 39

38.	38.	38.	37.	37.	37.	37.	36.	36.	36.
35.	35.	35.	34.	34.	34.	34.	33.	33.	33.
32.	32.	32.	32.	31.	31.	31.	31.	30.	30.
30.	30.	29.	29.	29.	29.	29.	28.	28.	28.
28.	28.	27.	27.	27.	27.	27.	27.	26.	26.
26.	26.	26.	26.	26.	25.	25.	25.	25.	25.
25.	25.	25.	24.	24.	24.	24.	24.	24.	24.

STAGE

115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1
115.1	115.1	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.3	115.3	115.3	115.3	115.3	115.3	115.3	115.3	115.3	115.3
115.3	115.3	115.3	115.3	115.3	115.3	115.4	115.4	115.4	115.4
115.4	115.4	115.4	115.4	115.4	115.4	115.3	115.3	115.3	115.3
115.3	115.3	115.3	115.4	115.4	115.4	115.4	115.4	115.4	115.4
115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4
115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.5
115.5	115.5	115.5	115.5	115.5	115.5	115.6	115.6	115.6	115.6
115.6	115.6	115.6	115.7	115.7	115.7	115.7	115.8	115.9	116.0
116.1	116.2	116.3	116.4	116.5	116.6	116.7	116.8	117.0	117.1
117.2	117.2	117.2	117.1	117.1	117.1	117.1	117.1	117.1	117.1
117.1	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	116.9
116.9	116.9	116.9	116.9	116.9	116.8	116.8	116.8	116.8	116.7
116.7	116.7	116.7	116.6	116.6	116.6	116.6	116.5	116.5	116.5
116.5	116.4	116.4	116.4	116.4	116.3	116.3	116.3	116.3	116.3
116.2	116.2	116.2	116.2	116.1	116.1	116.1	116.1	116.1	116.1
116.0	116.0	116.0	116.0	116.0	115.9	115.9	115.9	115.9	115.9
115.9	115.9	115.8	115.8	115.8	115.8	115.8	115.8	115.8	115.8
115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.6

PEAK OUTFLOW IS 142. AT TIME 40.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	142.	74.	44.	17.	5007.
CMS	4.	2.	1.	0.	142.
INCHES		1.72	4.10	4.85	4.85
MM		43.67	104.25	123.19	123.24
AC-FT		37.	88.	103.	103.
THOUS CU M		45.	108.	128.	128.

STATION OUTFLO, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.

9k 40

1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	4.	4.	4.	4.	4.
5.	5.	5.	5.	6.	6.	6.	6.	7.	7.
7.	7.	8.	8.	8.	9.	10.	11.	13.	15.
17.	20.	22.	25.	33.	69.	92.	103.	126.	173.
210.	200.	169.	144.	129.	119.	111.	105.	100.	92.
81.	71.	64.	60.	58.	57.	56.	55.	55.	54.
53.	53.	53.	52.	52.	51.	51.	51.	50.	50.
50.	49.	49.	49.	49.	48.	48.	48.	48.	47.
47.	47.	47.	46.	46.	46.	46.	46.	45.	45.
45.	45.	45.	44.	44.	44.	44.	44.	43.	43.
43.	43.	43.	43.	42.	42.	42.	42.	42.	42.
42.	42.	41.	41.	41.	41.	41.	41.	41.	41.
40.	40.	40.	40.	40.	40.	40.	40.	39.	39.
39.	39.	39.	39.	39.	38.	37.	37.	36.	35.
33.	32.	30.	28.	27.	27.	26.	26.	26.	25.
25.	24.	23.	23.	22.	22.	21.	21.	20.	20.
19.	19.	18.	18.	17.	17.	17.	16.	16.	15.
15.	15.	14.	14.	13.	13.	13.	12.	12.	12.
				STORAGE					
18.	18.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	20.	20.	20.	20.	20.	20.
21.	21.	21.	21.	21.	21.	21.	22.	22.	22.
22.	22.	22.	22.	22.	22.	22.	22.	22.	22.
22.	22.	22.	22.	22.	22.	22.	22.	22.	22.
22.	22.	22.	22.	22.	22.	22.	22.	22.	22.
22.	22.	22.	22.	22.	22.	22.	22.	22.	22.
22.	22.	22.	23.	23.	23.	23.	23.	23.	23.
24.	24.	24.	24.	24.	25.	25.	25.	25.	25.
26.	26.	26.	26.	27.	27.	28.	29.	30.	31.
33.	34.	35.	37.	38.	39.	40.	40.	41.	41.
42.	42.	41.	41.	41.	40.	40.	40.	40.	40.
40.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
38.	38.	38.	38.	38.	38.	38.	38.	37.	37.
37.	36.	36.	36.	35.	35.	35.	35.	34.	34.
34.	33.	33.	33.	32.	32.	32.	32.	31.	31.
31.	31.	30.	30.	30.	30.	30.	29.	29.	29.
				STAGE					
115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1
115.1	115.1	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2

SH 41

115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.3	115.3	115.3
115.3	115.3	115.3	115.4	115.4	115.4	115.4	115.4	115.4	115.4
115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.4	115.5	115.5
115.5	115.5	115.5	115.5	115.4	115.4	115.4	115.4	115.4	115.4
115.4	115.4	115.4	115.4	115.5	115.5	115.5	115.5	115.5	115.5
115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5
115.5	115.5	115.5	115.5	115.5	115.5	115.6	115.6	115.6	115.6
115.6	115.6	115.7	115.7	115.7	115.7	115.7	115.8	115.8	115.8
115.8	115.9	115.9	115.9	115.9	116.0	116.0	116.1	116.2	116.3
116.5	116.6	116.7	116.8	117.0	117.1	117.1	117.1	117.2	117.2
117.3	117.3	117.2	117.2	117.2	117.1	117.1	117.1	117.1	117.1
117.1	117.1	117.1	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	116.9	116.9	116.9	116.9	116.9	116.9
116.8	116.8	116.8	116.8	116.7	116.7	116.7	116.7	116.6	116.6
116.6	116.5	116.5	116.5	116.5	116.4	116.4	116.4	116.4	116.4
116.3	116.3	116.3	116.3	116.2	116.2	116.2	116.2	116.2	116.1

PEAK OUTFLOW IS 210. AT TIME 40.25 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	210.	104.	60.	25.	7335.
CMS	6.	3.	2.	1.	208.
INCHES		2.41	5.54	7.11	7.11
MM		61.30	140.84	180.47	180.53
AC-FT		51.	118.	151.	152.
THOUS CU M		63.	146.	187.	187.

STATION OUTFLO, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	1.	1.	2.	2.
2.	2.	2.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	5.	5.	5.	5.	5.	6.	6.
6.	7.	7.	7.	8.	8.	9.	9.	10.	10.
10.	11.	11.	12.	12.	13.	14.	16.	19.	21.

Sh 42

24.	29.	68.	97.	112.	121.	126.	131.	159.	223.
271.	256.	211.	178.	159.	145.	135.	128.	121.	111.
95.	81.	72.	68.	65.	64.	63.	62.	61.	60.
60.	59.	59.	58.	58.	57.	57.	56.	56.	55.
55.	55.	55.	54.	54.	54.	53.	53.	53.	52.
52.	52.	52.	51.	51.	51.	51.	50.	50.	50.
50.	50.	49.	49.	49.	49.	49.	48.	48.	48.
48.	48.	47.	47.	47.	47.	47.	47.	46.	46.
46.	46.	46.	46.	46.	45.	45.	45.	45.	45.
45.	44.	44.	44.	44.	44.	44.	44.	43.	43.
43.	43.	43.	43.	42.	42.	42.	42.	42.	42.
42.	42.	41.	41.	41.	41.	41.	41.	41.	41.
40.	40.	40.	40.	40.	40.	40.	40.	40.	39.
39.	39.	39.	39.	39.	39.	38.	38.	37.	36.
35.	34.	33.	31.	29.	28.	27.	26.	26.	26.

STORAGE

18.	18.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	20.	20.	20.	20.	21.	21.
21.	21.	22.	22.	22.	22.	22.	22.	22.	22.
23.	23.	23.	23.	23.	23.	23.	23.	23.	23.
23.	23.	23.	23.	23.	23.	23.	23.	23.	23.
23.	23.	23.	23.	23.	23.	23.	23.	23.	23.
23.	23.	23.	23.	23.	23.	23.	23.	23.	23.
23.	23.	24.	24.	24.	24.	24.	24.	25.	25.
25.	25.	26.	26.	26.	26.	27.	27.	27.	28.
28.	28.	29.	29.	29.	30.	31.	32.	33.	35.
36.	38.	39.	40.	40.	40.	41.	41.	41.	42.
43.	43.	42.	41.	41.	41.	41.	41.	40.	40.
40.	40.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	38.	38.
38.	38.	38.	38.	38.	38.	38.	38.	38.	37.

STAGE

115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1
115.1	115.1	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.3	115.3	115.3	115.3
115.4	115.4	115.4	115.4	115.5	115.5	115.5	115.5	115.5	115.5
115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5
115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.5
115.5	115.5	115.5	115.5	115.5	115.5	115.5	115.6	115.6	115.6
115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6
115.6	115.6	115.6	115.6	115.6	115.7	115.7	115.7	115.7	115.7

34 43

115.8	115.8	115.8	115.9	115.9	115.9	115.9	116.0	116.0	116.0
116.1	116.1	116.1	116.1	116.2	116.2	116.3	116.4	116.5	116.7
116.8	117.0	117.1	117.1	117.1	117.1	117.2	117.2	117.2	117.3
117.3	117.3	117.3	117.2	117.2	117.2	117.2	117.2	117.2	117.1
117.1	117.1	117.1	117.1	117.1	117.1	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	116.9	116.9	116.9	116.9	116.9

PEAK OUTFLOW IS 271. AT TIME 40.25 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	271.	133.	71.	32.	9352.
CMS	8.	4.	2.	1.	265.
INCHES		3.09	6.61	9.06	9.06
MM		78.59	167.93	230.12	230.18
AC-FT		66.	141.	193.	193.
THOUS CU M		81.	174.	238.	238.

STATION OUTFLO, PLAN 1, RATIO 5

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	1.	2.	2.	2.
2.	3.	3.	3.	3.	4.	4.	4.	4.	4.
4.	4.	4.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	6.	6.	6.	6.	7.	7.	7.	8.
8.	9.	9.	10.	10.	11.	11.	12.	13.	13.
14.	14.	15.	15.	16.	17.	19.	21.	24.	30.
75.	107.	120.	129.	137.	144.	149.	156.	192.	274.
333.	310.	253.	211.	187.	171.	158.	150.	142.	128.
108.	90.	80.	74.	72.	70.	69.	68.	67.	66.
65.	65.	64.	64.	63.	62.	62.	61.	61.	61.
60.	60.	60.	59.	59.	59.	58.	58.	58.	57.
57.	57.	56.	56.	56.	56.	55.	55.	55.	55.
54.	54.	54.	54.	54.	53.	53.	53.	53.	53.
52.	52.	52.	52.	52.	51.	51.	51.	51.	51.
51.	50.	50.	50.	50.	50.	50.	49.	49.	49.
49.	49.	49.	48.	48.	48.	48.	48.	48.	48.
47.	47.	47.	47.	47.	47.	46.	46.	46.	46.

Sh 44

46.	46.	46.	45.	45.	45.	45.	45.	45.	45.
44.	44.	44.	44.	44.	44.	44.	43.	43.	43.
43.	43.	43.	43.	42.	42.	42.	42.	42.	42.
42.	41.	41.	41.	41.	41.	41.	41.	41.	41.

STORAGE

18.	18.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	19.	20.	20.	20.	21.	21.	21.
22.	22.	22.	22.	23.	23.	23.	23.	23.	23.
23.	24.	24.	24.	24.	24.	24.	24.	24.	24.
24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
24.	24.	24.	25.	25.	25.	25.	26.	26.	26.
27.	27.	27.	28.	28.	28.	29.	29.	29.	30.
30.	30.	31.	31.	32.	32.	33.	35.	36.	38.
40.	40.	40.	41.	41.	41.	41.	41.	42.	43.
44.	43.	43.	42.	42.	41.	41.	41.	41.	41.
40.	40.	40.	40.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.
39.	39.	39.	39.	39.	39.	39.	39.	39.	39.

STAGE

115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1	115.1
115.1	115.1	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2	115.2
115.2	115.2	115.2	115.2	115.2	115.3	115.3	115.3	115.4	115.4
115.4	115.5	115.5	115.5	115.5	115.5	115.6	115.6	115.6	115.6
115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6
115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6
115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6
115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7
115.7	115.7	115.7	115.7	115.7	115.8	115.8	115.8	115.8	115.9
115.9	115.9	116.0	116.0	116.1	116.1	116.1	116.2	116.2	116.2
116.3	116.3	116.3	116.3	116.4	116.4	116.5	116.7	116.8	117.0
117.1	117.1	117.1	117.2	117.2	117.2	117.2	117.2	117.2	117.3
117.4	117.4	117.3	117.3	117.2	117.2	117.2	117.2	117.2	117.2
117.1	117.1	117.1	117.1	117.1	117.1	117.1	117.1	117.1	117.1
117.1	117.1	117.1	117.1	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0

Sh 45

117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0
117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0

PEAK OUTFLOW IS 333. AT TIME 40.25 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	333.	161.	82.	38.	10878.
CMS	9.	5.	2.	1.	308.
INCHES		3.76	7.65	10.54	10.54
MM		95.39	194.23	267.67	267.73
AC-FT		80.	163.	225.	225.
THOUS CU M		99.	201.	277.	277.

********** ********** ********** ********** **********

Sh 46

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .10	RATIO 2 .20	RATIO 3 .30	RATIO 4 .40	RATIO 5 .50
HYDROGRAPH AT	INFLOW	.29	1	148.	296.	443.	591.	739.
		(.75)	(	4.19)(	8.37)(	12.56)(	16.74)(	20.93)(
ROUTED TO	OUTFLO	.29	1	40.	44.	49.	53.	57.
		(.75)	(	1.12)(	1.24)(	1.38)(	1.50)(	1.61)(
HYDROGRAPH AT	INFLOW	.11	1	59.	119.	178.	237.	297.
		(.28)	(	1.68)(	3.36)(	5.04)(	6.72)(	8.40)(
2 COMBINED	COMBIN	.40	1	97.	159.	220.	282.	343.
		(1.04)	(	2.74)(	4.49)(	6.23)(	7.98)(	9.72)(
ROUTED TO	OUTFLO	.40	1	52.	142.	210.	271.	333.
		(1.04)	(	1.48)(	4.02)(	5.94)(	7.68)(	9.43)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	121.10	121.00	133.00
STORAGE	15.	13.	305.
OUTFLOW	5.	0.	70.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	122.08	0.00	32.	40.	0.00	42.25	0.00
.20	123.56	0.00	60.	44.	0.00	42.75	0.00
.30	125.02	0.00	91.	49.	0.00	43.00	0.00
.40	126.40	0.00	122.	53.	0.00	43.00	0.00
.50	127.70	0.00	154.	57.	0.00	43.00	0.00

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	115.06	115.04	116.94
STORAGE	18.	18.	38.
OUTFLOW	0.	0.	27.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.10	117.03	.09	39.	52.	7.00	42.50	0.00
.20	117.18	.24	41.	142.	18.00	40.50	0.00
.30	117.27	.33	42.	210.	27.75	40.25	0.00
.40	117.34	.40	43.	271.	36.25	40.25	0.00
.50	117.41	.47	44.	333.	37.75	40.25	0.00

APPENDIX

D

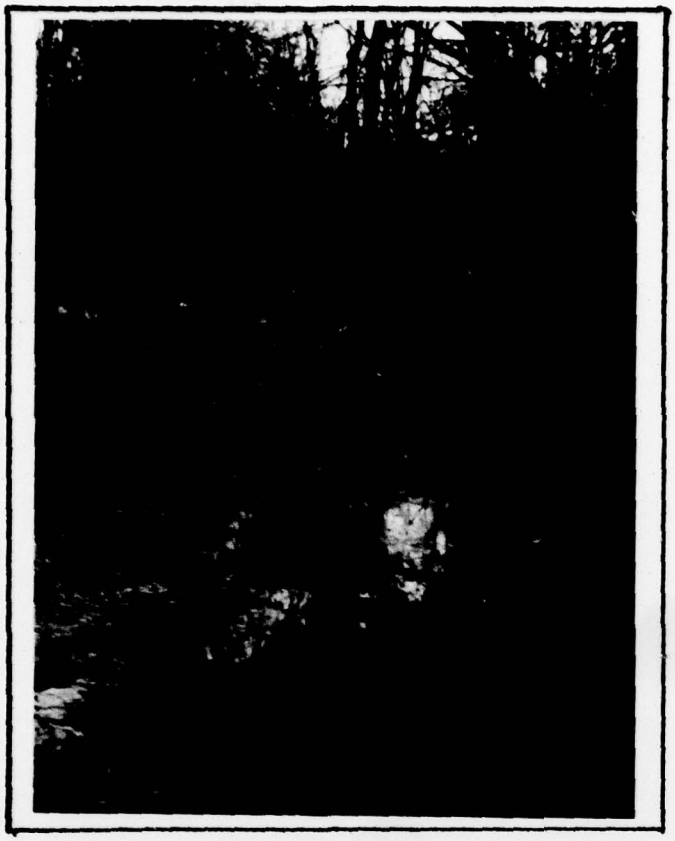
Photographs

UPSTREAM FACE AND THE TOP OF THE DAM
FROM THE RIGHT ABUTMENT 4/11/79

UPSTREAM FACE AND THE TOP OF THE DAM
FROM THE LEFT ABUTMENT 4/11/79

UPSTREAM ENTRANCE TO THE
DROP INLET SPILLWAY 4/11/79

SEEPAGE AND STANDING WATER AT THE DOWNSTREAM
TOE OF THE EMBANKMENT NEAR THE RIGHT ABUTMENT
4/11/79



SEEPAGE AND STANDING WATER NEAR THE DOWN-STREAM RIGHT ABUTMENT 4/11/79

SEEPAGE AND STANDING WATER AT THE CENTER OF THE EMBANKMENT DOWNSTREAM 4/11/79

GENERAL VIEW OF THE DOWNSTREAM SLOPE OF THE EMBANKMENT 4/11/79

DOWNSTREAM CHANNEL FROM THE TOP OF THE DAM 4/11/79

APPENDIX

E

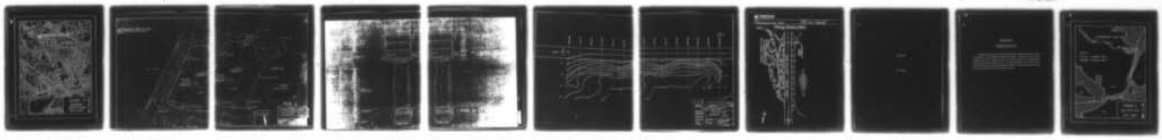
Drawings

TABLE OF CONTENTS - APPENDIX E

AD-A074 323 NEW JERSEY DEPT OF ENVIRONMENTAL PROTECTION TRENTON F/G 13/2
NATIONAL DAM SAFETY PROGRAM. AMPHIBIOUS LAKE DAM (NJ 00457), DE--ETC(U)
JUN 79 J J WILLIAMS DACW61-79-C-0011

UNCLASSIFIED NL

2 OF 2
AD A074323



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DATE FILMED
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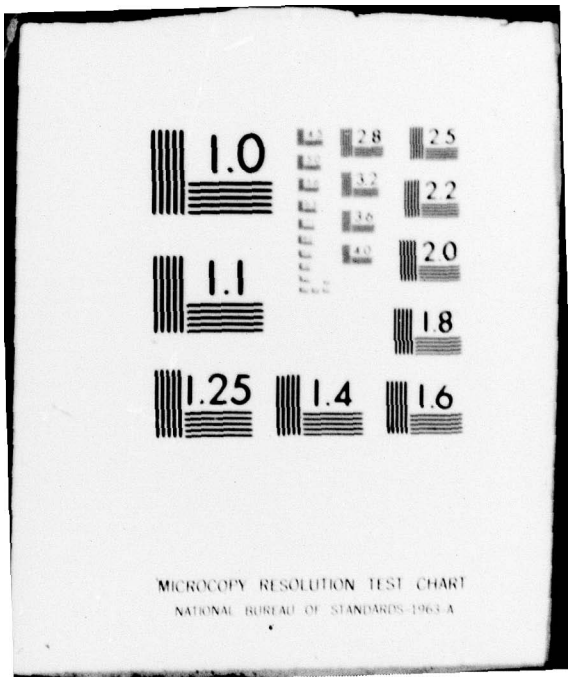
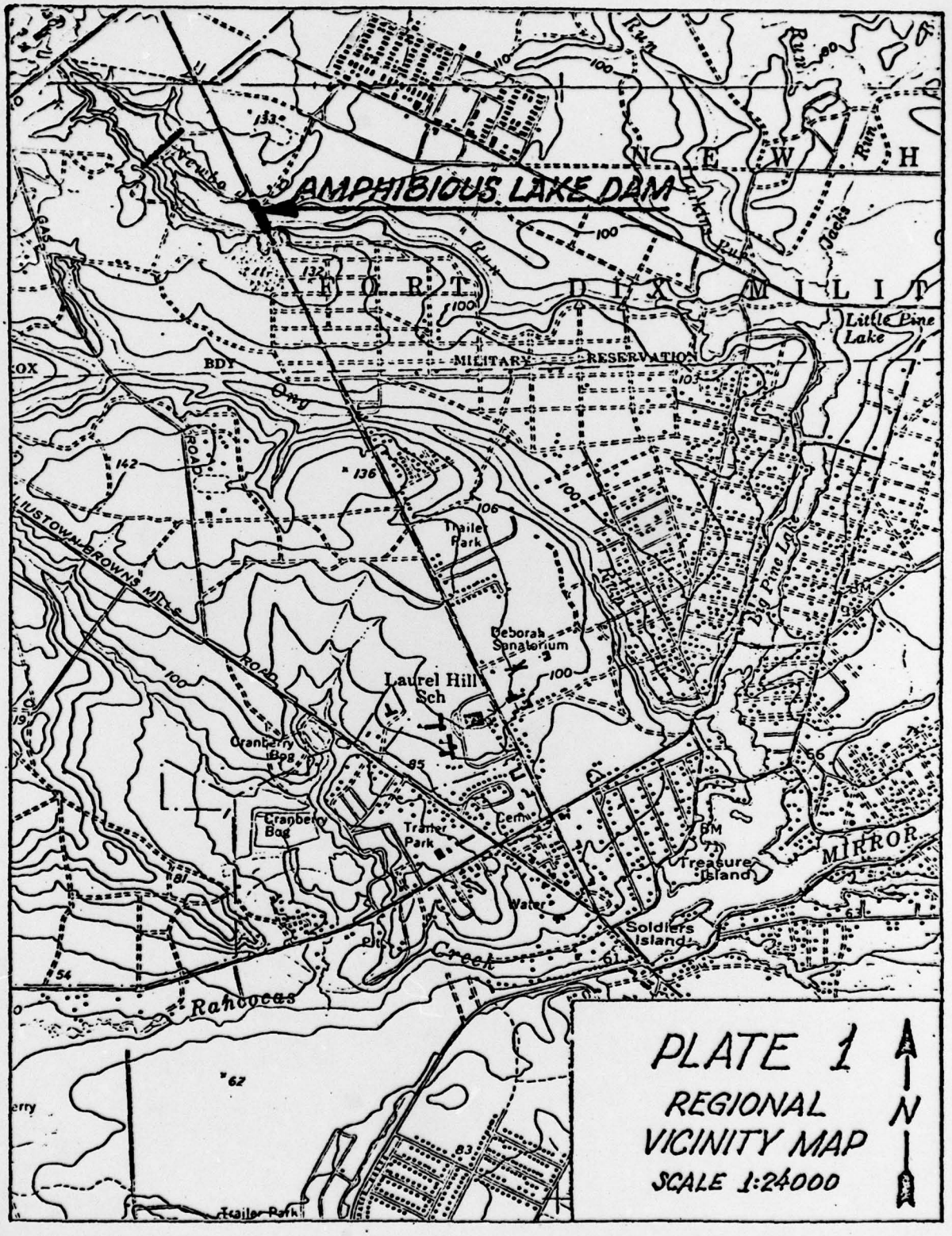
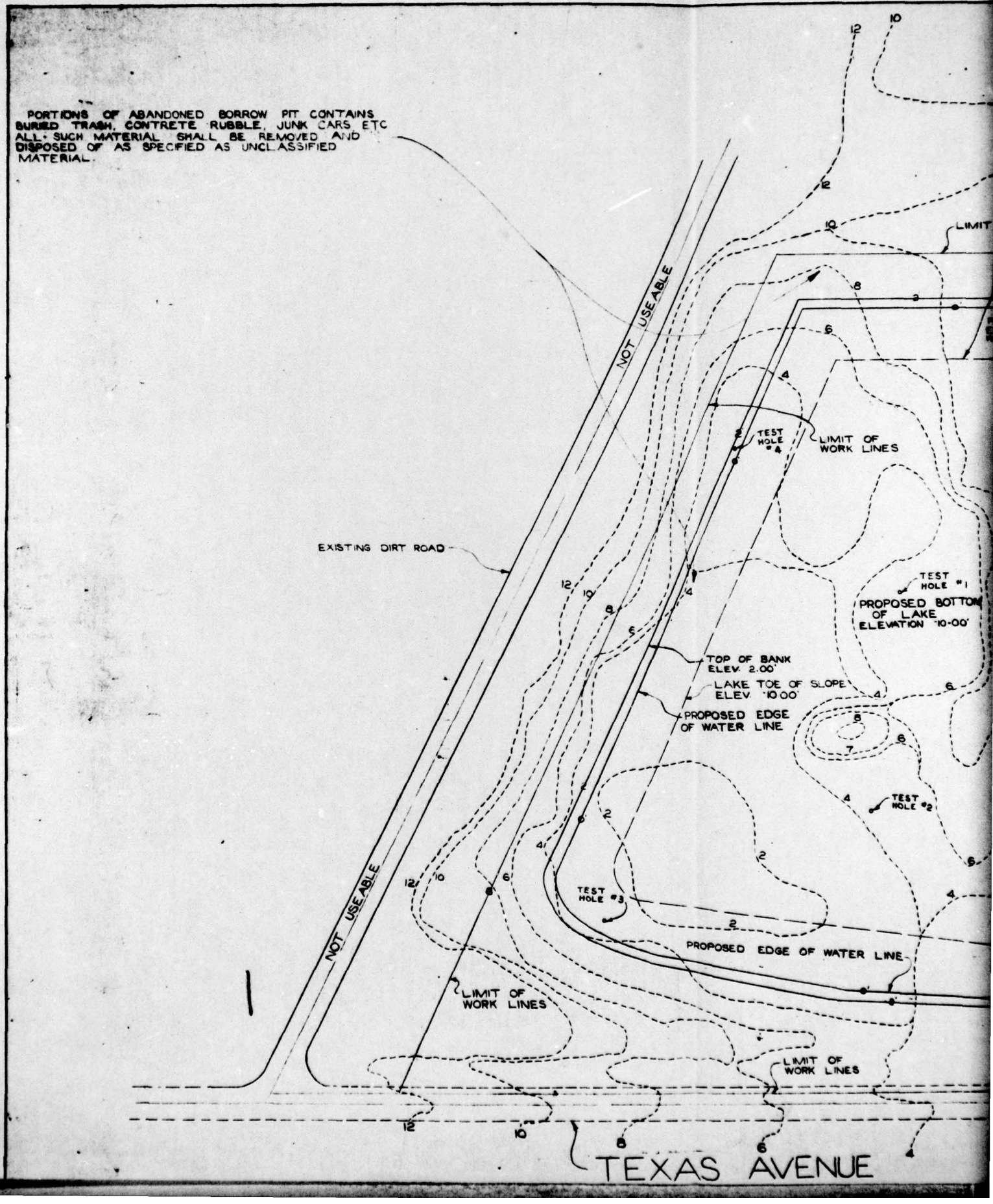
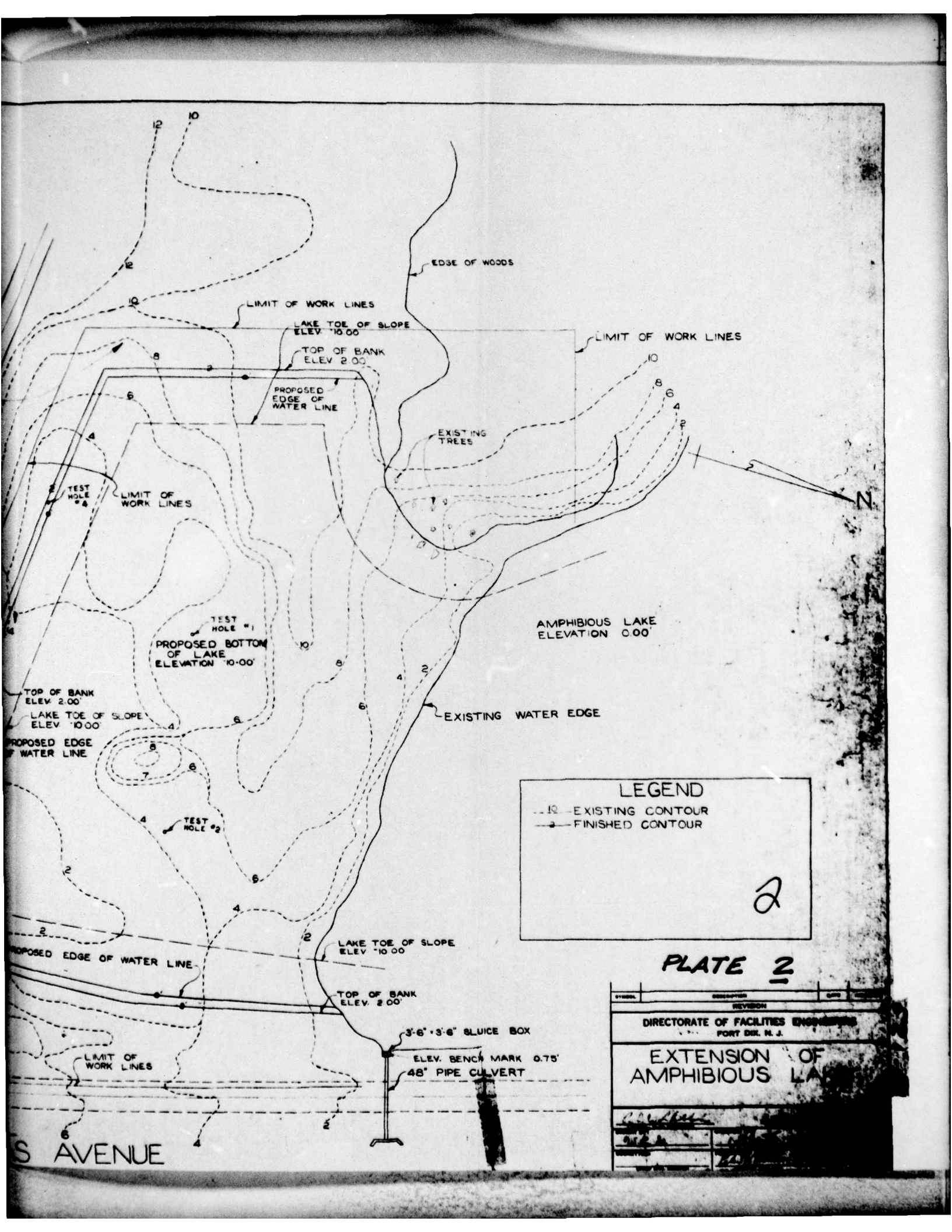
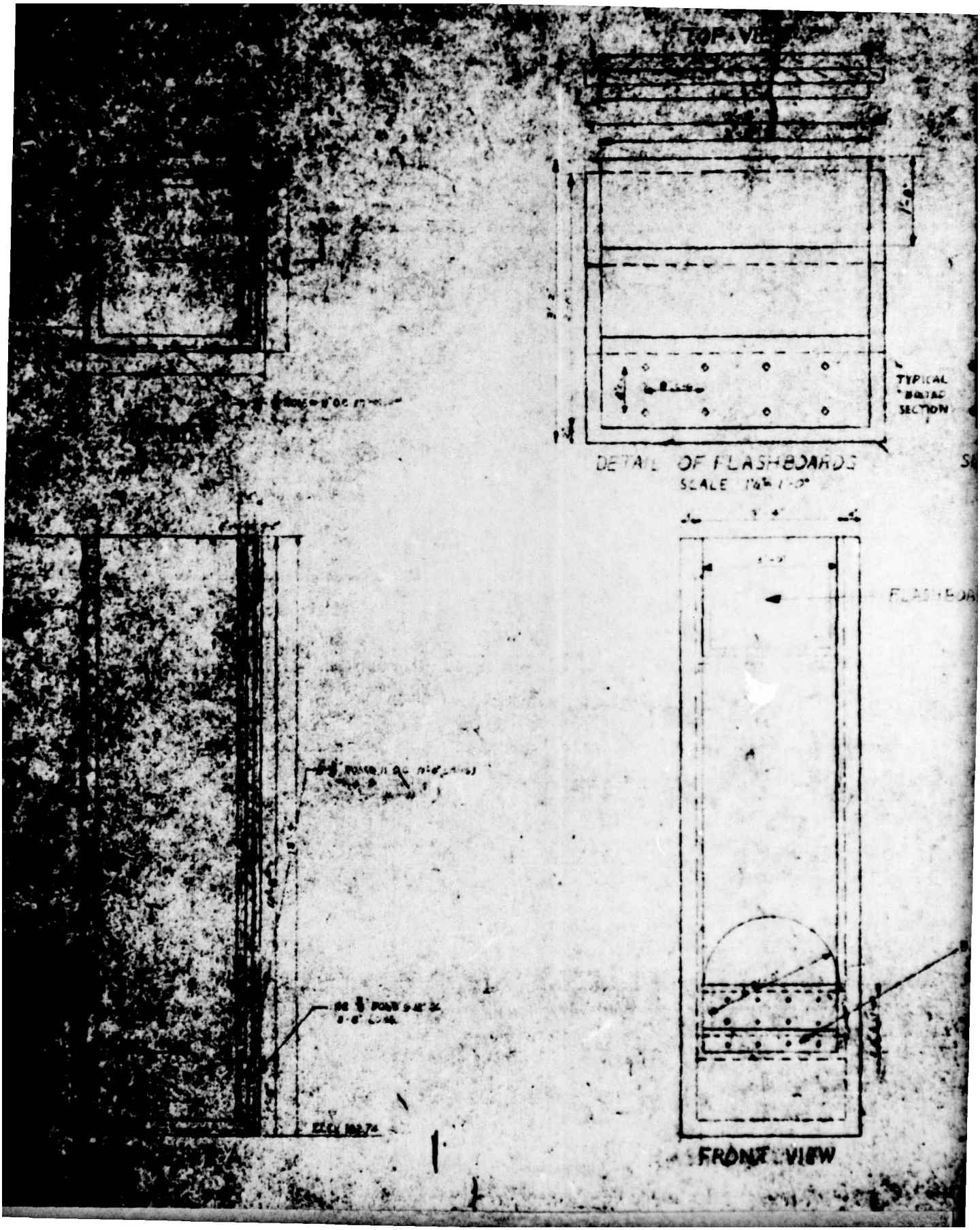
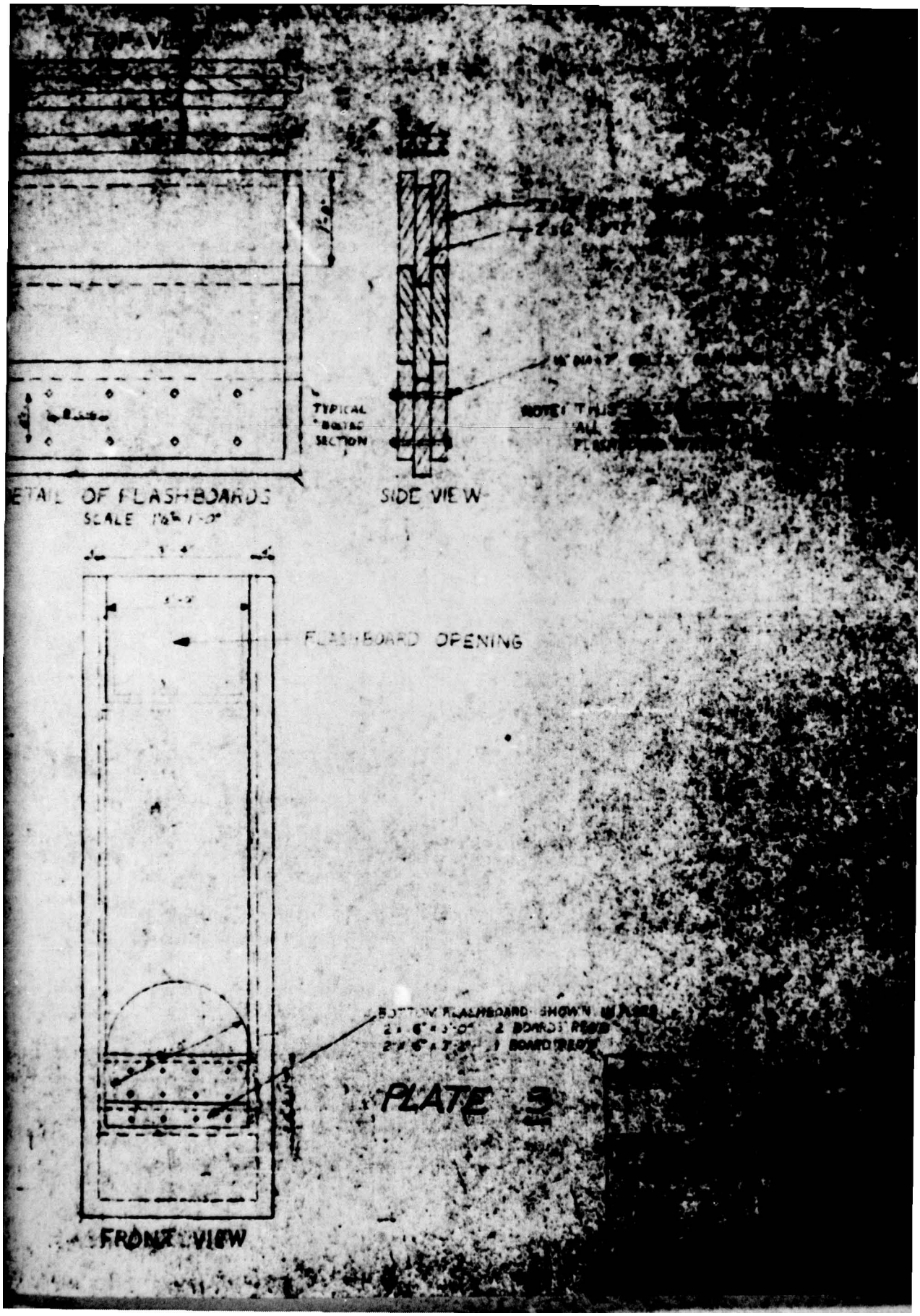

1.0
1.1
1.25
1.4
1.6
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.8
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A


AMPHIBIOUS LAKE DAM
FORT DIX MILITARY RESERVATION
NEWWH
Little Pine Lake
Big Pine Lake
BDY
ROAD
JUSTOWN-BROWNS MILLS
Deborah Sanatorium
Laurel Hill Sch
Cranberry Bog
Trailer Park
Treasure Island
MIRROR
Soldiers Island
Creek
Rancocas
Trailer Park
PLATE 1
REGIONAL VICINITY MAP
SCALE 1:24000
N


PORTIONS OF ABANDONED BORROW PIT CONTAINS BURIED TRASH, CONTRETE RUBBLE, JUNK CARS ETC ALL SUCH MATERIAL SHALL BE REMOVED AND DISPOSED OF AS SPECIFIED AS UNCLASSIFIED MATERIAL.
NOT USEABLE
NOT USEABLE
EXISTING DIRT ROAD
TEST HOLE #4
LIMIT OF WORK LINES
TEST HOLE #1
PROPOSED BOTTOM OF LAKE ELEVATION -10.00'
TOP OF BANK ELEV. 2.00'
LAKE TOE OF SLOPE ELEV. -10.00'
PROPOSED EDGE OF WATER LINE
TEST HOLE #2
TEST HOLE #3
PROPOSED EDGE OF WATER LINE
LIMIT OF WORK LINES
LIMIT OF WORK LINES
TEXAS AVENUE


EDGE OF WOODS
LIMIT OF WORK LINES
LAKE TOE OF SLOPE ELEV. 10.00
TOP OF BANK ELEV. 2.00
PROPOSED EDGE OF WATER LINE
LIMIT OF WORK LINES
EXISTING TREES
N
TEST HOLE #4
LIMIT OF WORK LINES
TEST HOLE #1
PROPOSED BOTTOM OF LAKE ELEVATION 10.00
AMPHIBIOUS LAKE ELEVATION 0.00
TOP OF BANK ELEV. 2.00
LAKE TOE OF SLOPE ELEV. 10.00
PROPOSED EDGE OF WATER LINE
EXISTING WATER EDGE
TEST HOLE #2
LAKE TOE OF SLOPE ELEV. 10.00
PROPOSED EDGE OF WATER LINE
TOP OF BANK ELEV. 2.00
3'-6" x 3'-6" SLUICE BOX
ELEV. BENCH MARK 0.75'
48" PIPE CULVERT
LIMIT OF WORK LINES
S AVENUE
LEGEND
10 EXISTING CONTOUR
2 FINISHED CONTOUR
2
PLATE 2
SYMBOL
DESCRIPTION
DATE
REVISION
DIRECTORATE OF FACILITIES ENGINEERING
FORT DIX, N. J.
EXTENSION OF AMPHIBIOUS LA


TOP VI
TYPICAL
SECTION
DETAIL OF FLASHBOARDS
SCALE
FRONT VIEW


TYPICAL
SECTION
SIDE VIEW
SCALE
FLASHBOARD OPENING
FRONT VIEW
PLATE 3

Station 2+00
Station 1+80
Station 1+60
Station 1+40
Station 1+20
Station 1+00
N
℄ Road
of
118
117
116
115
114
113
112
111
110
109
108
20'
40'
60'
80'

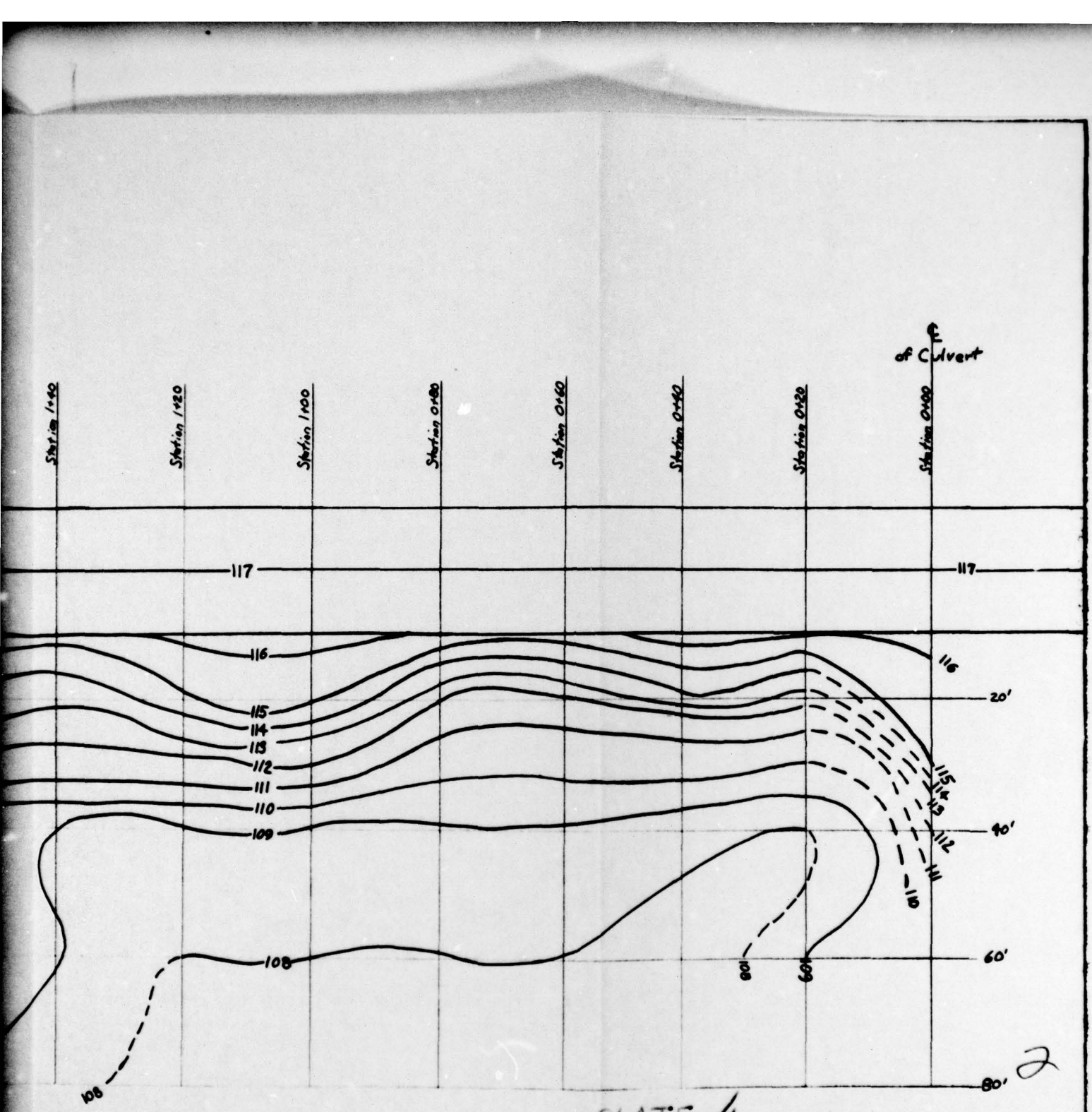


PLATE 4

Contour Interval = 1 Ft

B-0033

REV	DATE	DESCRIPTION	BY

86TH ENGINEER BATTALION (CONS)
FT. DIX, NEW JERSEY

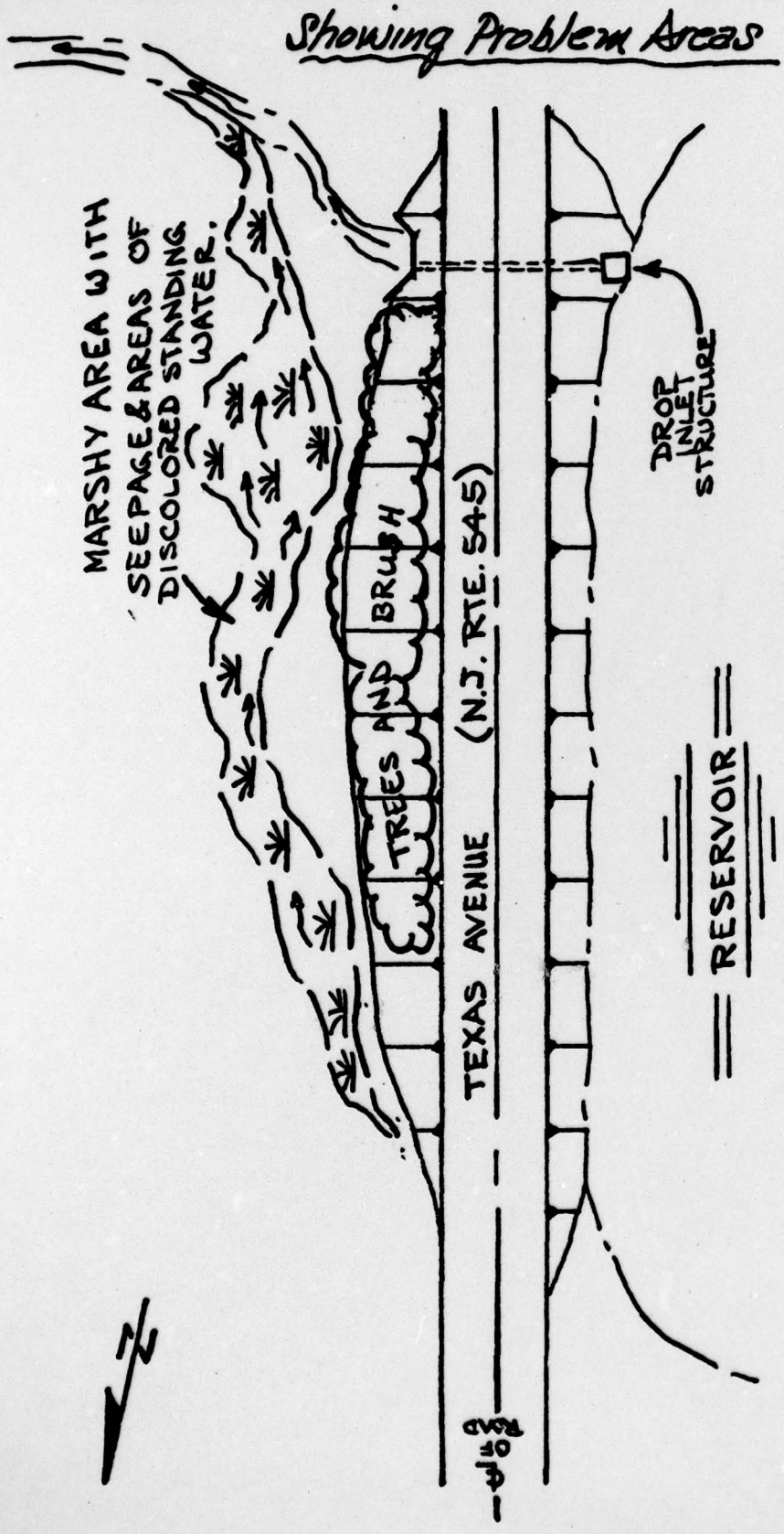
DRAWN BY T. LLANES	CONTOUR MAP AMPHIBIAN LAKE TEXAS AVE	
TRACED BY		
CHECKED BY		
SUBMITTED	APPROVED	DRAWING NUMBER 8C-GI-14
DATE 6 MAR 61	SCALE 1" = 30'	SHEET 1 OF 1

R.E. 192-

O'BRIEN & GERE ENGINEERS, INC.

SUBJECT	SHEET	BY	DATE	JOB NO
AMPHIBIOUS LAKE DAM	5	DBC	4/27/79	

Showing Problem Areas



APPENDIX

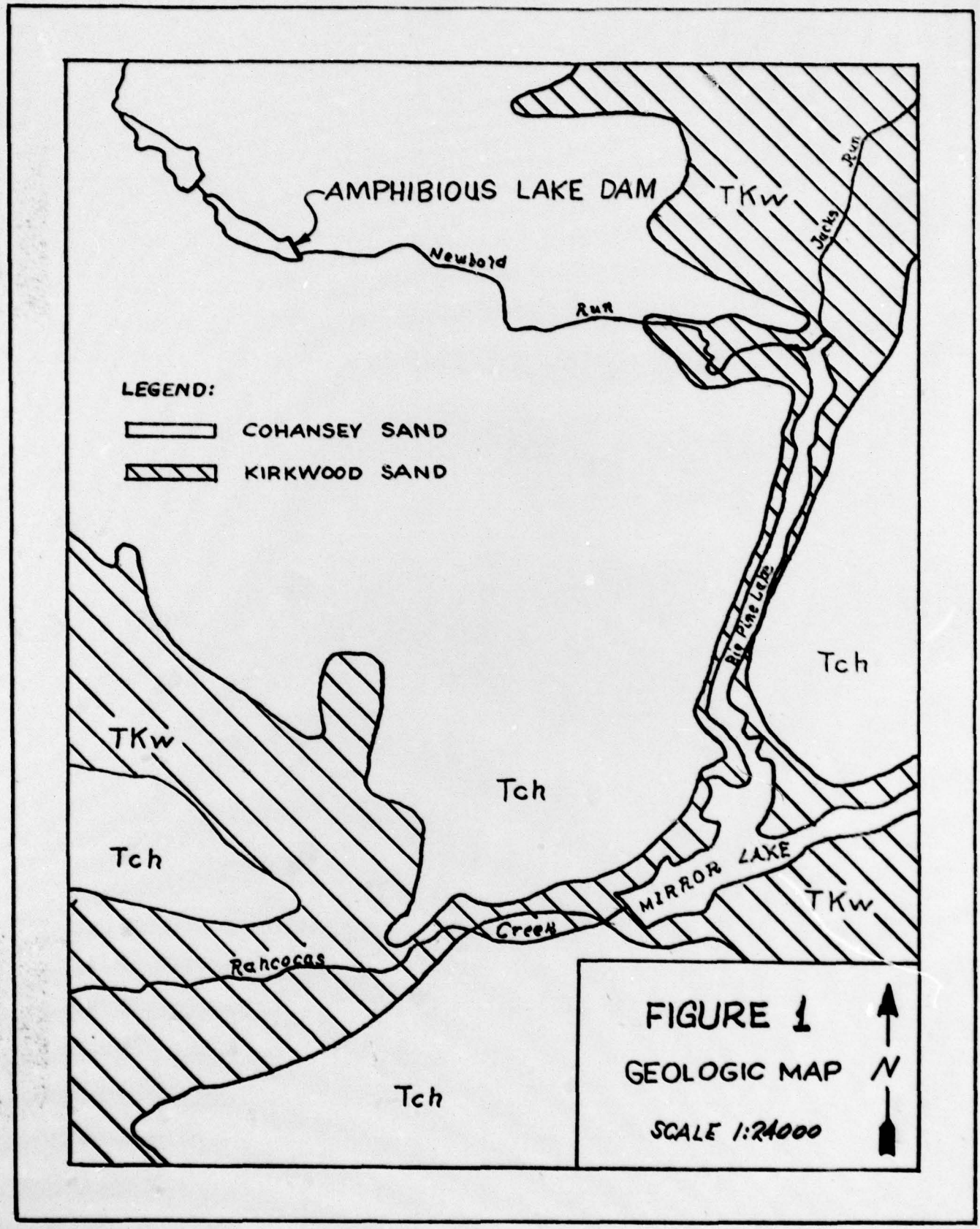
F

Site Geology

SITE GEOLOGY

AMPHIBIOUS LAKE DAM

Amphibious Lake is located in the Coastal Plain physiographic province which is composed of unconsolidated sedimentary deposits. These beds form a wedge-shaped mass that is exposed at the fall line and thickens in a southeasterly direction towards the Atlantic Ocean. The surficial deposit at the dam site is a bed of tertiary sands called the Cahansey formation. No faults or major structural defects are noted in the vicinity of the dam or lake.


AMPHIBIOUS LAKE DAM
TKw
Jacks Run
Newbold
Run
LEGEND:
COHANSEY SAND
KIRKWOOD SAND
Big Pine Lake
Tch
TKw
Tch
Tch
MIRROR LAKE
TKw
Creek
Rancocas
Tch
FIGURE 1
GEOLOGIC MAP
SCALE 1:24000
N